THE IRON AGE

New York, January 23, 1919

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THE IRON AGE

New York, January 23, 1919

ESTABLISHED 1855 VOL. 103 : No. 4

Conversion of White Iron Into Foundry

How Chinese Native Irons May Be Made Available as a Means of Relieving the Scarcity of Other Grades in That Country

BY C. T. HUANG*

OWING to the European war there has been a great shortage of pig iron in the Far East, because America has forbidden pig iron exportations. The supply of pig iron from China and Japan is not enough to meet the demand, so that the price has advanced up from 30 taels to 170 taels per ton. According to the present rate of exchange 1 tael is equal to $1.29 gold.

Chinese Native Iron Furnaces

There are about 150 native iron blast furnaces in China capable of producing two to six tons of pig iron per furnace per day, using cold blast. These furnaces cannot produce a grade of iron suitable for foundry use, as the sulphur content is sometimes as high as 0.22 per cent, and the silicon as low as 0.04 per cent. Sometimes they can produce good basic iron, because most of them use charcoal as fuel. The only modern iron and steel plant owned by the Chinese in China is the Hanyang Iron & Steel Works. There are still some others of the modern type in China and in Japan, but the total production of them is not enough for the demand of the Eastern market.

In Hanyang, our superintendent, Dr. Z. T. K. Woo, suggested the remelting of all the iron plates used for pavement in the works for the purpose of changing them into iron that could be sold at high prices. We had successfully remelted 1000 or 2000 tons of plates in our blast furnaces at the beginning of the year and realized a good profit through the increase in production.

As the demand for pig iron is so great and the price so high, about 170 taels per ton at the time of writing, our superintendent suggested the buying of all the native white iron at a low price to be remelted, and converting it into a good grade iron in our furnaces. He asked the writer to make a trial of thus converting the native iron into good iron in our blast furnaces. Our works comprises four blast furnaces, two small ones and two large ones, the smaller ones rated at 100 tons each per day, and the larger ones at 250 tons each per day, but owing to shortage of transportation of coke on account of the civil war, we have had to stop one of the large furnaces, and it is being repaired; therefore we have only three furnaces running.

THE Chinese native iron smelters produce a considerable quantity of white pig iron in their 150 primitive furnaces. Confronted with the scarcity of imports of foundry iron, Dr. Woo, superintendent of the Hanyang Iron & Steel Works, suggested the converting in blast furnaces of this high sulphur, low silicon iron into a suitable foundry iron, and this article discusses the problems involved and the cost.

Changing White Iron Into Foundry

The smelting of the native white iron into foundry pig is not simply a melting process as is the remelting of foundry scrap or iron plate of good quality, but involves a process of metallurgical conversion, changing part of the combined carbon into graphitic, the removal of sulphur down to the permissible limit and the introduction of silicon up to about 2 per cent. It requires heat to melt iron and much more heat to convert the white iron into foundry. The hearth heat in the blast furnace is only sufficient for its own work, therefore it is necessary either to lighten the burden or to increase the coke consumption for the smelting of the native white iron. The amount of heat is equivalent to one ton coke to four tons iron.

After various attempts I found that our three furnaces, now running, could take up only 40 tons of native iron, equivalent to 10 per cent of the daily output, without interfering with the normal working of the furnaces. This is governed by the relation of iron to the slag volume. It is through the medium of slag that the sulphur is partly if not all eliminated, silicon introduced and carbon changed into the graphitic form. It may be possible for the furnace to smelt a higher tonnage than 10 per cent of its own capacity by adding slag and coke to the charge, but it must not be forgotten that the slag and coke occupy space, sacrificing furnace capacity.

Some of the Limitations

There is another point which puts a limit upon the smelting of the native white iron up to more than 10 per cent of the furnace capacity. Uniformity in the distribution and descent of the stock is of prime importance in the smooth operation of blast furnaces. We note that scrap iron, charged together with ore, limestone and coke into the furnace, descends much faster, causing a chilled hearth and the production of off-grade iron. This is because of the higher specific gravity of iron compared with other constituents of the charge and

*The author is blast-furnace engineer, Hanyang, China.

the action of differential sinking and separation resembles closely that of a pneumatic jig used in ore dressing.

This jigging action was observed and proved to have taken place in the blowing out of one of our furnaces, as we had charged, on blowing the furnace out, 80 tons of limestone on top of the charge, and on racking the material out we found that the limestone came down to the hearth quicker, leaving a large layer of coke on the top, showing very clearly a distinct and separate layer of coke and limestone. This tends to support the theory that one cannot charge too much white iron into the furnace at a time because of the difference in specific gravity, tending to produce a chilled hearth.

Recently we experimented by adding more scrap pig than the amount permitted into one of our furnaces and at the same time lightened the burden. The result was the chilling of the hearth and the production of bad iron, which required remelting and conversion in the furnace again. To raise the hearth heat, the furnace with a light burden has to be run with a decreased supply of blast which imparts a higher heat to the slag, giving rise to hanging and other consequent irregularities. Therefore it is rather risky to smelt more than 10 per cent of the furnace capacity.

Cost of the Conversion

The cost of smelting white iron into foundry is as follows:

Coke (1 ton of coke to 4 tons of iron)	3.211 taels
Coal	0.055 tael
Labor	0.728 tael
Materials	0.603 tael
General expenses	2.164 taels
Duty	1.000 taels
Total cost per ton	7.761 taels

This cost is only approximate, but we believe that it is fairly accurate for making estimates. It will be seen that the transportation and marketing charges are not included in the list.

There is another very important point. The displacement of ore charge by the native white iron decreases the furnace capacity for smelting our ore, the iron content of which is about 60 per cent. For every 250 kg. of white iron entering into the furnace per charge, we have to lighten the ore burden by 100 kg., equivalent to 60 kg. Fe. The average number of charges in our three furnaces per day is 160, which means that the capacity of the furnaces for smelting ore is reduced by 9.6 metric tons of iron as against 40 metric tons of white iron smelted in place of the ore.

Relative Profits

The relative profit and minimum selling price for smelting the white iron is of prime value from a commercial standpoint because the cost of producing one ton of iron from the ore is much lower than that from the native iron and consequently the profit made from smelting the ore is proportionately greater. Whether it is judicious to purchase native white iron, turning it into foundry pig in the blast furnaces, hinges upon the additional profit which could be gained from this transaction without lowering the profit which could be gained from the smelting of the ore on account of the displacement of the furnace capacity.

The problem, due to the difference of the first cost prices, is dependent on the condition that the profit made from smelting 40 tons native iron per day should be greater than that lost through displacement of furnace capacity of 9.6 tons of iron from ore smelting. To solve this problem it is necessary to determine the minimum selling price of the iron at which no profit can be made and this is really the keynote of the whole solution.

Let K = minimum selling price at which the profit made from smelting native iron is balanced by the loss of furnace capacity for ore smelting.

X = cost price of native iron ex-Hanyang furnace.

A = smelting cost per ton of native iron at Hanyang furnace.

40 = tons of native iron that could be smelted per day.

9.6 tons of iron from ore smelting but lost by displacement through the smelting of 40 tons of native iron.

$[K - (A + X)]40 - 9.6(K - 20) = 0$ (no profit), so long as the smelting price is above the value of K the deal in native iron will be profitable.

The price of native iron varies from 50 taels to 95 taels per ton. If we assume the cost price of native iron per ton as 50 taels, then

X = 50 taels, price per ton ex-Hanyang furnace.

A = 7.8 taels, cost of smelting per ton of white iron.

K = minimum selling price.

$$[K - (7.8 + 50)]40 - 9.6(K - 20) = 0$$

$$40K - 312 - 2000 - 9.6K + 192 = 0$$

$$30.4K = 2120$$

$$K = \frac{2120}{30.4} = 69.77 \text{ taels}$$

The price of foundry iron is 170 taels per ton, therefore, by smelting 1 ton native iron we can get a profit of 100.23 taels.

There are about 500,000 tons of native iron in China. If this can be converted into good foundry pig, there will be a profit of about 50 million taels. The question then is, how many tons of white iron can be converted in a day into foundry pig so as to make a quick profit. From the above, we note that one furnace can handle only 10 per cent of its own capacity which puts a limit upon the "quick profit." It may be possible to smelt the white iron in a separate furnace mixing it with the proper proportion of slag and coke and a little maganese ore. The native pig iron has to be broken to proper size before entering into the furnace. By doing so we avoid to a certain extent the separation of native iron from other constituents due to jigging action. The original size of the native pig is in the form of a brick 10 x 8 x 1 in. By using this method I believe a 100-ton furnace can handle 300 to 400 tons white iron a day easily, using hot blast.

Will Abandon Electric Welding Training

WASHINGTON, Jan. 21.—H. A. Horner, head of the Electric Welding Branch Education and Training Section, has announced that the Fleet Corporation has decided to abandon all electric welding training for shipbuilders and that the various training centers at Schenectady, Brooklyn, Cleveland, San Francisco and Philadelphia have been closed.

The San Francisco and Philadelphia projects were conducted solely by the Fleet Corporation. The other three were established in conjunction and co-operation with manufacturers of welding apparatus—the General Electric Co. at Schenectady; the Quasi-Arc Weldtrode Co., Brooklyn, and the Lincoln Electric Co., Cleveland.

"The splendid efforts of these manufacturers in working with the corporation to further the development of electric welding has brought about immediate results, and doubtless could the arrangement have been continued, notable developments in the application of electric welding to shipbuilding could have been reported," says Mr. Horner's announcement. The General Electric Co. spent considerable money, both in the training center maintained at Schenectady and in independent research work conducted by the company itself. It is understood that this company spent as much money on these investigations and study of electric welding as the Fleet Corporation did to maintain its Electric Welding Committee."

Steel Castings on the Pacific Coast

Growth of the Industry Due to the War— Good Steel Made Without Pig Iron— Overcoming Manufacturing Difficulties

THE great development in the manufacture of steel castings on the Pacific Coast is one of the noteworthy effects of the European war, and was discussed by J. D. Fenstermacher of the Columbia Steel Co., San Francisco, Cal., before the Milwaukee convention of the American Foundrymen's Association in October, 1918, in a paper "Making Steel Castings on the Pacific Coast."

Since the beginning of the conflict, the growth of the steel casting industry has been remarkable, not only from a technical but from a commercial point of view. Incidentally, the great mineral resources of the Western states have also been developed. The state of California in particular is playing an important part by furnishing materials that are vitally essential to the steel industry of our country. Steel castings are manufactured in the states of Washington, Oregon and California, using the crucible, the converter, and the electric, basic and open-hearth furnaces.

Geographical Disadvantages

Primarily our geographical location has placed us all in a position which has been more or less disadvantageous to the healthy growth of our business. However, from day to day, we are becoming more confident because conditions are changing rapidly and in directions that are beneficial to us. I am unable to predict miracles until great manufacturing plants that will create demands for steel castings such as are in the East are established in our territory. We have no gigantic establishments for building locomotives, cars, rolling-mill machinery, machine tools and many other products. However, we are gradually entering this field, and today we are building locomotives, cars and machinery, not, it is true, on a scale compared with the East, but to an extent commensurate with our demands, brought about by conditions with which you are all familiar.

Prior to the outbreak of the European war the steel founders on the Pacific Coast encountered innumerable manufacturing difficulties. Conditions are different from those that prevail in the Middle West and on the Atlantic Coast. In order to be successful it requires considerable experience, and one must be thoroughly familiar with the peculiar operations which are therefore customarily carried on in the Pacific Coast territory.

The making of steel castings in this territory is not a recent accomplishment. Some were made in 1885 in San Francisco; of course not on a large scale but of a fair quality. The companies that made them have long ago gone into other lines of manufacture, possibly because the demand for this product was not large enough to warrant continuation on a commercial basis.

The oldest and largest company on the Pacific Coast in continuous operation is the Columbia Steel Co. of San Francisco. My connection with this company dating from my arrival in California over five years ago will enable me to outline its development. During that period I have participated in the struggles incidental to the commercial operation of an open-hearth steel foundry in a pioneer territory. Some of the problems mentioned will no doubt apply to all of the other steel foundries on the Western coast.

In 1909 the Columbia Steel Co. was organized and took over for operation the converter steel foundry which had been started in 1902 by the Columbia Engineering Works in Portland, Ore. This was the only active steel foundry in the Northwest at that time. In the same year ground was broken for the location of a new plant at Pittsburg, Contra Costa county, Cal., within fifty miles of San Francisco. The plant site is on the New York slough of the San Joaquin River, which with the Sacramento River, empties into the waters of Suisun Bay a short distance away. These are the two largest rivers in the state of California, flowing from the south and north respectively, both navigable to a certain extent by vessels of moderate draft. The company maintains two docks on the New York slough. There are also three other lines of transportation, the Southern Pacific, the Santa Fe and the Oakland, Antioch & Eastern railroads, the last named being electrically operated.

Steel Made Without Pig Iron

From experience gleaned in the operation of the Portland plant it was decided to build a plant in California with facilities which would enable the company to produce large castings commercially as well as economically. A vital problem was confronted—the use

Plant of Columbia Steel Co. at Pittsburg, Cal.

of pig iron. No satisfactory material of this nature being produced west of the Rocky Mountains, it was necessary to transport it from Eastern sources. The cost of bringing the iron from the east is a fact well worth considering. The installation of a basic open-hearth furnace was decided upon. This furnace was to make steel suitable for castings, the melting charge consisting of all scrap material, eliminating the use of pig iron. The practice proved itself a success and to this day is still in vogue.

The entire plant was erected under the personal supervision of S. T. Wellman, the well-known engineer. In this connection he was assisted by D. H. Botchford, the present general manager of the company, who also supervised the initial manufacturing operations. Molds were made for the first heat which was tapped and poured successfully on Nov. 23, 1910.

Overcoming Manufacturing Difficulties

I will endeavor to point out some of the manufacturing difficulties experienced primarily by our isolation from the so-called centers of production, also, giving as briefly as possible a description of what has been done to overcome some of these difficulties and the material results achieved.

Manufacturers of steel castings are confronted with a necessity for three vital things—scrap, sand and experienced mechanics. The question of scrap is being given serious consideration in the far West, not only by steel foundrymen but by the rolling mills which consume more of this material from the foundries. The present demand for scrap exceeds the production. Pig iron is being produced in very small quantities on the Pacific Coast and this production is not sufficient to offset the rapidly diminishing quantity of scrap. However, steps are being taken to produce suitable pig iron locally on a large scale. This will be the solution of this vital question. California has considerable ore deposits, but coking coal has always been a drawback. Nevertheless, there are favorable indications as to the nearby source for the quantity production of suitable coke, and I hope the time is not far off when the Pacific Coast will be producing enough pig iron for its own consumption.

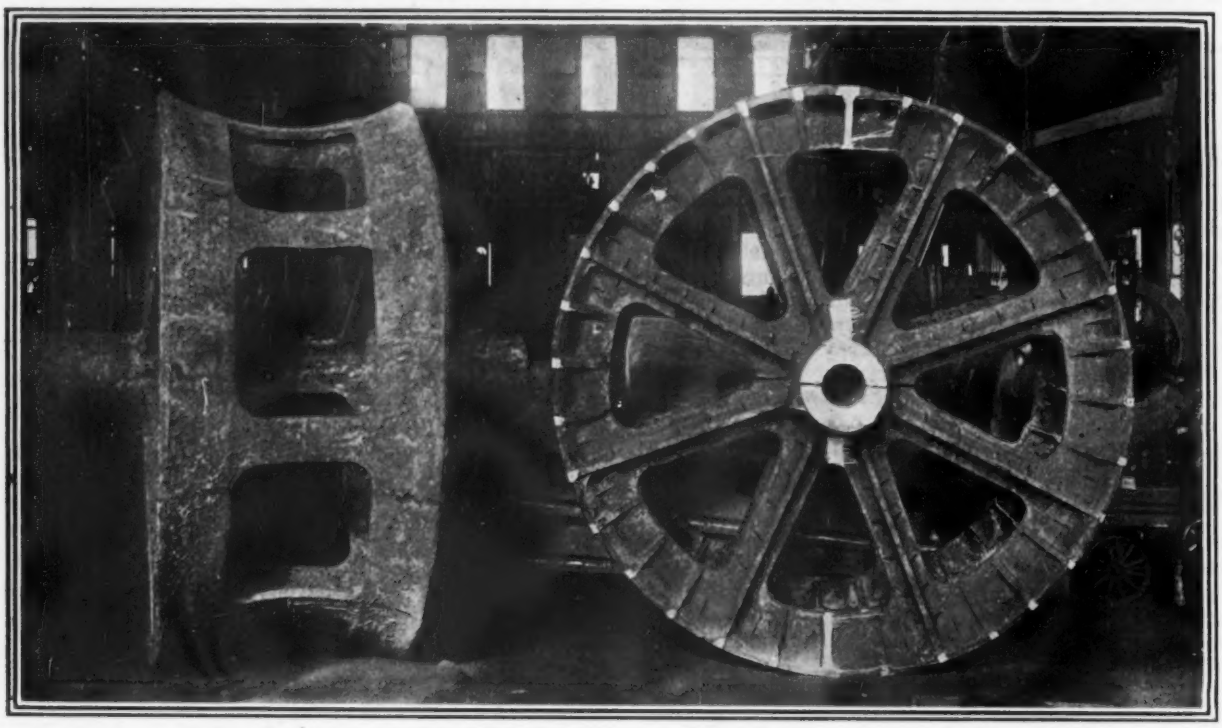
Sand from Illinois

Next in importance is silica sand. This material is nearly all transported from Illinois. Local sands, including beach sands, have been used, but they are not nearly so satisfactory as the natural Eastern standards. The transportation of Eastern sand is a determining factor in our manufacturing costs. I understand that certain grades of this material have been located in nearby states. This would lessen transportation costs and difficulties somewhat.

Suitably trained mechanics have always been scarce. The importation of this class of labor from the East has not only been expensive but has proved unsatisfactory. The only solution of this problem is for the manufacturers to train their own help. In some places this has been done to a certain extent, but all of the foundrymen on the Coast cannot do so.

The absence of stable and multiple work has a great effect on our manufacturing costs. The reason for this has been explained in the foregoing. It is very essential, therefore, that the jobbing shop must be provided with mechanics that have a wide experience in all kinds of work, and flask equipment must be varied and flexibile. It may also be necessary to use considerable wooden flask equipment according to the nature of the work, and the community in which the shop is located.

The melting stock used at the present time in the basic furnace at the Columbia plant is obtained locally from railroads, mines, smelters, gold-dredges, oil fields and shipyards. Scrap brake shoes are considered good material, but are not always obtainable. Clean steel turnings are used in small quantities. The melting is done by oil fuel exclusively. This material is delivered by barges to the company's dock and pumped into storage tanks. Facilities are such that delivery can also be made by tank cars, if emergencies demand. Either steam or air is used for atomizing.



One Piece Bucket Idler for Gold Dredge

Analysis of Raw Materials

The magnetite iron ore, limestone, dolomite and calcined magnesite are all secured from nearby sources. The following typical analyses herewith will show the quality of these materials.

	Per Cent
MAGNETITE—	
Silica	4.0
Iron oxide	90.0
LIMESTONE—	
Silica	0.2
Iron and alumina	0.2
Calcium carbonate	99.5
DOLOMITE—	
Silica	0.2
Iron and alumina	0.3
Calcium carbonate	55.7
Magnesium carbonate	43.8
MAGNESITE—	
Silica	6.0
Iron and alumina	5.0
Lime	1.0
Magnesia	88.0

Standard ferromanganese and ferrochrome are produced by nearby electric smelters. Fifty per cent ferrosilicon, nickel, vanadium and other alloys are obtained from Eastern manufacturers. Magnesite and chrome brick are also transported from regular Eastern sources. The freight charges on all this material has its influence on operating costs, which causes the foundrymen considerable concern.

Quality of the Steel

In order to convey an intelligent idea of the quality of steel for castings, to meet any recognized specifications, made from the basic all-scrap charged furnace, the following chemical and physical characteristics are given as representing castings made for the Government:

Table of Analyses and Tests of Basic Open-Hearth Steel Castings

Heat No.	Elastic Limit, Lb. per Sq. In.	Tensile Strength, Lb. per Sq. In.	Elongation in 2 In.	Reduction of Area	Analysis, Per Cent: Carbon	Silicon	Sulphur	Phosphorus	Manganese
47	35,000	70,000	31	54	0.26	0.30	0.029	0.015	0.59
58	33,000	64,000	22	60	0.20	0.36	0.030	0.015	0.55
66	34,500	68,500	30	56	0.25	0.32	0.038	0.018	0.62
79	33,600	67,200	32	58	0.25	0.28	0.038	0.019	0.63
93	32,000	62,000	35	68	0.21	0.34	0.040	0.013	0.68
95	36,000	66,400	30	60	0.23	0.33	0.039	0.018	0.74
96	32,500	63,000	33	60	0.23	0.33	0.039	0.018	0.74
100	33,000	66,000	31	56	0.22	0.34	0.026	0.015	0.57.
125	38,500	75,500	25	50	0.28	0.30	0.040	0.015	0.53
146	33,600	64,800	28	60	0.24	0.31	0.029	0.014	0.58
150	32,000	60,800	35	63	0.18	0.32	0.026	0.013	0.62
154	55,000	94,500	25	54	0.30	0.25	0.028	0.013	0.53*
160	31,000	60,500	36	64	0.19	0.33	0.031	0.018	0.58

*Nickel, 2.70 per cent.

Acid Open-Hearth Furnace

In 1916 increased demands for tonnage were great enough to warrant additional melting facilities. It was decided to install an acid open-hearth furnace. One of medium size was considered necessary in order to produce metal in fair quantities during periods that the basic furnace was shut down for major repairs. These repairs are more frequent for this furnace than the average basic furnace that uses scrap and pig iron. However, in spite of the severe service imposed by melting all scrap, an average of 370 heats has been produced. The last run was the best ever made, when 411 heats were turned out before it was necessary to rebuild the furnace.

The acid furnace was built to melt the foundry scrap produced by the basic furnace. Chemical characteristics of this scrap are given in the foregoing table showing material made for castings by the basic furnace. About 90 to 92 per cent of this scrap is used, the balance being made up of standard low-phosphorus pig iron. When the furnace is used for making heats to pour medium and small castings, the heats average about four tons each. This furnace has been operated continuously since last summer, and to date over 1000 heats have been melted. Analyses of the steel made by this process for castings for the Government are as follows:

Table of Analyses and Tests of Acid Open-Hearth Steel Castings

Heat No.	Elastic Limit, Lb. per Sq. In.	Tensile Strength, Lb. per Sq. In.	Elongation in 2 In.	Reduction of Area	Analysis, Per Cent: Carbon	Silicon	Sulphur	Phosphorus	Manganese
560	36,000	70,000	31	51	0.28	0.30	0.041	0.035	0.57
564	31,500	61,000	32	56	0.21	0.24	0.043	0.035	0.66
571	31,500	60,500	30	50	0.20	0.33	0.043	0.039	0.48
582	35,000	69,000	29	52	0.28	0.28	0.044	0.036	0.61
642	32,000	65,000	32	51	0.21	0.31	0.034	0.036	0.70
707	36,500	70,500	29	52	0.28	0.36	0.034	0.027	0.65
710	36,000	68,300	27	53	0.27	0.27	0.040	0.029	0.57
730	40,000	76,500	27	46	0.31	0.30	0.034	0.016	0.67
738	32,500	62,000	28	53	0.21	0.26	0.036	0.033	0.56
741	41,000	78,500	26	49	0.35	0.29	0.038	0.024	0.73
752	37,000	72,500	30	57	0.30	0.33	0.044	0.041	0.64
758	50,000	91,000	23	48	0.43	0.30	0.039	0.040	0.59

All the steel foundries on the Pacific Coast are called upon to produce a great variety of castings up to the limit of their melting capacity, but the Columbia Steel Co., being the largest manufacturer west of the Rocky Mountains, is called upon to make some very large castings. However, recently this company has had inquiries for castings beyond its present melting capacity. Inasmuch as this situation has developed, the management has authorized the installation of another basic furnace. This will give the Pittsburgh plant three furnaces.

National Foreign Trade Council

The National Foreign Trade Council will hold its sixth national foreign trade convention at the Congress Hotel, Chicago, on Thursday, Friday and Saturday, April 24, 25 and 26. The formal call will be issued shortly by the chairman of the council, James A. Farrell, president, United States Steel Corporation.

The convention in April will deal with Foreign Trade as a Factor in Stabilizing American Industry—problems involving the conversion of war industries to the needs of peace; development of our foreign trade to provide employment for our soldiers, sailors and war workers, and the formation of a definite policy dealing with the future of our new shipping.

The procedure of the convention will be along the lines that have proved so successful in the past: general sessions with prepared papers by the leading authorities, followed by discussion; group sessions, consisting mainly of discussion, in which the special interests of different types of business are treated; individual conferences with Government representatives and trade advisers.

"The Journal of American Steel Treaters Society" of Chicago has appeared and promises to contain valuable information, particularly for steel metallurgists. The chairman of the publication committee is A: F. MacFarland, metallurgist, U. S. Ball Bearing Mfg. Co., Chicago. It is to be a monthly issue representing the activities of the American Steel Treaters Society of Chicago, of which T. E. Baker, production engineer, Miehle Printing Press & Mfg. Co., Chicago, is president, and A. G. Henry, metallurgist, Illinois Tool Works, Chicago, is secretary-treasurer.

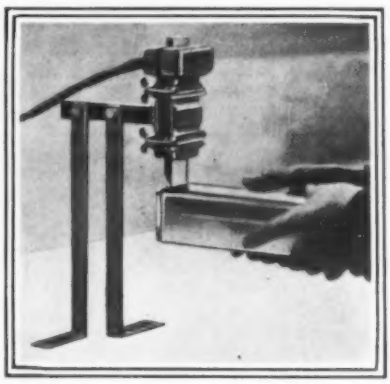
Market for American Products

WASHINGTON, Jan. 20.—Cardenas with a population of 32,000 inhabitants, is rated as one of the chief industrial centers of Cuba, and offers a favorable market for the sale of American iron and steel products, such as rails, plates, bars, angles, and galvanized sheeting, says a report to the Department of Commerce made by Consular Assistant George A. Makinson at Cardenas. Three large machine shops and foundries located there employ approximately 500 skilled mechanics. These concerns specialize in the manufacture of boilers, tanks, conveyors, and other machinery used in the various sugar mills scattered throughout this consular district. There is also a recently established factory devoted to the construction of freight cars and similar railroad equipment. The United Railways of Habana (Ltd.) maintains an important repair shop and construction staff in this city and uses considerable steel for bridges and new trackage. Purchases for this undertaking are made through the company's chief purchasing agent, located in Habana.

That manufacturers may well take a page from the labor unions' book on organization, is the opinion of F. W. Hutchings, vice-president Charcoal Iron Co. of America, in an article on business readjustment in the *Detroit Saturday Night*. "If he lives to see the day when his own organizations," he writes, "are as effectively amalgamated in one central effort as those of his employees, he will have reason to congratulate himself. If he continues in his present disintegrated form disaster is certain to be his, and he will have none to blame but himself."

Soldering Iron for Cans

Several months ago a large biscuit manufacturer was pressed to meet the Government's schedule of hard bread which he was supplying. The difficulty lay, not in producing the bread, but in soldering the tin containers. This hard bread is packed in small square tin cans, and in order to expedite the soldering of the tops, 150 standard soldering irons were mounted in a horizontal position with a large steel square crosshead or clamp on the threaded stud at the end of the iron body, and under this a piece of bar copper placed vertically at the end of the iron. The cans were soldered by placing them against this piece of copper bar. So much heat was dissipated between the heating elements and the point of contact with the can that speed could not be maintained. To overcome this the body of the iron was wrapped with asbestos, which increased the temperature at the tip but shortened the life of the iron. They were returned in such quantity to the manufacturer, the Cutler - Hammer Mfg. Co., Milwaukee, for repairs that it was decided to investigate the conditions under which the irons were being used. The result was the special can soldering iron shown in the accompanying illustration.



Can Soldering Iron Designed for Rapid Production

The iron consists of a pair of heating units which are insulated with mica and then covered by a steel jacket pressed into close contact with the mica by hydraulic pressure. The heating units are placed on either side of a piece of bar copper and gripped between two iron plates forming a clamp. A suitable bracket for mounting the iron vertically is provided. The copper bar is from 1 in. to 1½ in. wide and from ¼ in. to ⅜ in. thick. The two heating units work independently of each other, and in case of a burn-out may be renewed separately. The units are known as type H units. For the can soldering appliance a modified construction is used to provide the proper protection against the fumes of the soldering flux. The flat copper bar conducts the heat rapidly from the two flat heating units with a consequent small loss of heat.

The Cuttler-Hammer Co. state that tests have shown that this new iron, rated at 200 to 225 watts, is capable of doing as much work per hour as a 400-watt standard soldering iron. The iron is designed for mounting on the bench, but it is possible to furnish a special handle to permit of its use as a hand tool if desired.

Increased Cost of Making Iron

Matthew Addy Co.'s market report for Jan. 18 says in part:

"The iron trade is struggling with the problem of readjustment. And incidentally it is making no perceptible progress. The main difficulty appears to be with the question of costs. An extensive maker of engines and boilers tells us that never before has he had as many inquiries as at present. The inquirers are expecting apparently to be able to buy more cheaply than was the case a few months ago, but with all labor and most raw materials as high as ever, the prices necessarily quoted are the war prices. It is the cost of producing things that is the main factor. For example, the furnace in the South that long had the reputation of making iron at a cost lower than any other furnace in the Union, and that back in 1895 sold iron at $5 a ton and survived, made iron in 1914 at $8 a ton. Their president the other day told us that his cost of making iron had gone up to $27 a ton."

Combination Plate Punching, Trimming and Shearing Machine

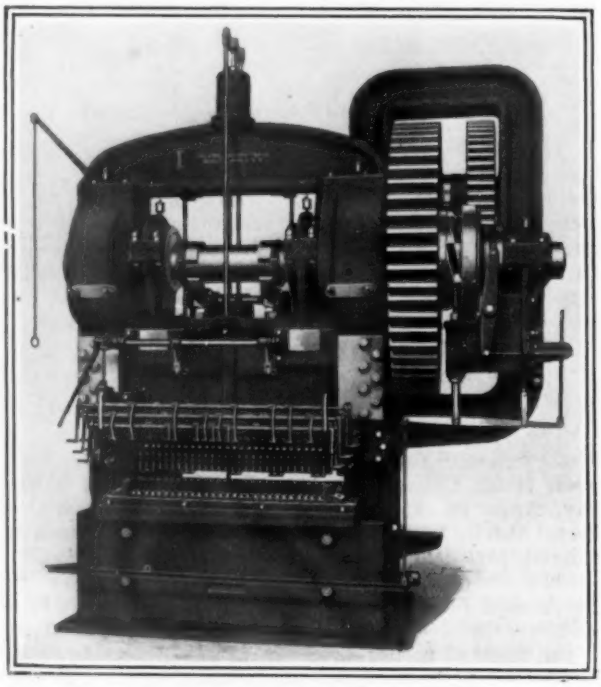
A combination multiple punching, trimming and shearing machine has recently been developed by the Long & Allstatter Co., Hamilton, Ohio. A cycle of operations is performed on a plate or sheet by this machine, which, it is claimed, would otherwise require three distinct machines, or at least three separate tool settings, if done on an ordinary punching machine.

The tool equipment is composed of individual adjustable punch and die holders for the punching operation a back upper and lower shear for the cutting-off operation, and a pair of side trimming shears, one set on each end of the tool holders.

The back shearing arrangement is to be used only as a separate operation. That is, when the main slide or ram, that controls the punching operation and the side trimming operation is performing its functions, the back shear arrangement is inoperative, or idle. Upon completing the punching and trimming of the sides of the plates to the width desired, the punch gags are pulled out of operation, or ungagged, and a rear shearing device is thrown into engagement. Then upon engaging the clutch with the master gear the end of the plate is sheared off exactly to length.

A safety device or lock is built into the machine, thus making it impossible for both the punch slide and the shear slide to function at the same time, which would result in spoiling a plate.

The stripping of the punches from the plate is done by means of an automatic stripper that has a direct vertical movement so that no side action or creeping motion is imparted to the plate.



The Cycle of Operations on This Plate Punching, Trimming and Shearing Machine Are Set in Motion and Stopped Automatically. A safety lock prevents the punch slide and shear slide from functioning simultaneously

All of the tools are clamped in position by T-head bolts that are readily accessible, requiring little effort on the part of the tool setter. The machine is provided with gag controllers that can be grouped in any series desired.

One interesting feature of the sliding mechanism is that it is balanced by air pressure, which the manufacturer claims after experiments to be a most efficient counterbalance for this type of machine. It works more successfully and economically in conjunction with a spacing table, with hand or automatic feed.

Tuesday noon luncheons have been established as one of the features of activity of the Engineers' Club of Philadelphia. A speaker is arranged for each luncheon on topics of interest to the engineer.

The Training Department—Past and Future

The Crippling of One Plant For Another— Real and Pretended Interest In Workmen — Some Training Plans For the Common Good

BY JOHN C. SPENCE

When the United States declared war against Germany in April, 1917, it was realized that the number of workers in industrial establishments was wholly inadequate for shop production on the necessary scale. In spite of the fact that we had been overwhelmed with orders for supplies of all kinds for the Allies for the three years preceding, we had done practically nothing as a nation to produce operators on a comprehensive plan.

The common practice from August, 1914, on, was to go out and get your neighbor's workers away from him by hook or by crook, and mostly by crook. We have fairly satisfactory evidence that before we declared war, some employment managers went so far as to make bargains with labor agitators at so much a head for each worker of certain types driven to obtain employment in sundry factories outside of his own community because of strikes brought on by the aid and suggestion of the agitators.

This was an extreme and, I am glad to say, a rare method. The method used by very many, was to send a representative to establish himself at a hotel in a busy community, to study local conditions as to wages and hours and to advertise for certain specified types of workers at rates that would attain his object.

Most of us have been guilty of either this method or the similar though less public but more efficient one of sending a man, one who knows his business, to a community and using no advertising whatever, except the passing of the word from one workman to his fellows.

A smart man can by this method, if backed by a large concern, absolutely skin a small community of all its best workers. I know this to be so because I have done it and could easily do it again.

Probably all factory executives know that this method of obtaining help was harmful to even the temporarily successful shop. The injured shop certainly knew it was.

Inoculation with the Germ of Travel

Within a short time almost all workers were inoculated with the germ of travel. Labor turnover became enormous. One executive told me of hiring 1000 people per week to maintain a force of 5000 in a shell shop. It became a frequent practice in some communities for common labor to stipulate that it be paid every night instead of by the week, thus freeing the worker from the trouble of going out to the plant after his money on pay day if he happened to pick up another job.

Employment managers held expensive and unsatisfactory conventions where saintly individuals told how they had obtained thousands of new employees without injury to their neighbors by means of this nostrum or that; by group insurance, by all kinds of bonuses, by speechmaking, backclapping, and handshaking, and by making it a point daily to ask John or Jim, "How are the wife and kids to-day?"

These things are all fine when they come from the heart instead of the head. I believe in them. I know that they were common practice before the days of these conventions and will be long after them. But those of us who knew exactly what was going on, realized that either the speakers were theoretical men whose integrity we did not question or else they were men too busy with affairs of management to have learned the exact details of how the job was being done. Too many of us had a community conscience in labor questions, a conscience created by social contact with executive neighbors, and one we did not have toward the man outside of our own town. In the end, however, the effect was the same whether we hurt our immediate neighbor or a remote labor competitor. We were all trying to put six pieces in seven places and each of us wanted all six for himself.

The Renewed Start in Training the Unskilled

There began to be glimmerings of intelligence after a time. Certain executives concluded that someone must start a movement of training the unskilled into skilled or semi-skilled workers. The scheme, of course, is an old one and dates back to the founding of industry in America, but, because we had had a sufficient supply of labor for many years, even the long-term apprentice system had practically gone.

Those who attempted to revive the scheme of training realized that it was more or less of a philanthropic effort, as unless practically all took hold of it an addition to the supply of workers would be of small consequence. However, someone had to make the start hoping that, if the plan was worth while, others would see the light.

In 1915 the Norton Grinding Co. started a training department because of the drain on Worcester's skilled help caused by the vast increase in munition work, tool work, etc., in that and neighboring towns. We found that the regular foreman in charge of production did not have the necessary time to give to the breaking in of green help or of help that had obtained only a partial training at other shops. We believed it would pay to have a separate training department for all beginners where they would remain long enough to learn the rudiments of machine-shop practice. We do not pretend to turn out, by means of this department, skilled machinists, although in the cases of those who have shown a natural gift for mechanics, it has been a wonderful revelation to see with what rapidity they have learned.

Our training department is in a gallery of one of our mills and is 23 ft. wide by 264 ft. long, an area of 6072 sq. ft. It has a tool crib operated under the same system as those in the regular production departments, and washrooms and toilets separate from the rest of the plant.

This department is now capable of turning out 300 to 400 workers per year of a degree of skill above the average available at our employment department before the armistice.

Keeping in Touch with the Learners

The general opinion in the shop is that the department is a good scheme. The shop foremen have orders not to hire any unskilled help to be used as producers, without first consulting with the supervisor of training. The supervisor is furnished with a list of all new employees so that he can check this item and get into immediaate touch with new men who may have come in under a misunderstanding concerning their ability as workmen and who might make good if given further training.

This assures the learners in the training department of obtaining the opportunities to get into the shop and at the same time, does not prevent the foreman from getting anyone into training in whom he is interested. When an opening in the shop presents itself, the supervisor selects from the school the person he thinks will best fill the place. The length of time the worker has spent in training has practically no bearing in the case. Some workers, in a few days, due to natural intelligence and ability, or due to the fact that their judgment has been matured by

years of experience in mechanical work, are better fitted to take shop jobs as operators than are other men not so fortunate. Men are not born equal; they are in this country simply born with equal rights.

After a worker leaves the training department and takes a job in the shop, the supervisor still continues to keep in touch with him for several weeks. This often saves workers from discouragement due to strange surroundings and the feeling of incompetence we all have when in contact with a bewildering proposition.

Our work consists in making high grade grinding machinery. We have all of the machinery in use in any machine shop or automobile plant. Hence our problem is similar to that of a great many firms.

Classroom Instruction

Beginners, in groups, are given classroom instruction, at the very start, in the reading of a steel rule, the setting of outside and inside calipers, and the reading of a micrometer caliper. The process of addition and subtraction of mixed numbers is done directly on the steel rule. No attention is paid to any fractional part of an inch other than those found on the rule itself. Decimals are taught directly on the micrometer caliper.

Blueprints are used to check up each pupil and to see that he understands the progressive steps of the teaching. On these blueprints blank spaces are left wherein he must put the dimensions obtained from measuring small models. These prints also serve as an introduction to blueprint reading. In connection with these blueprints it might be worth while to state that this scheme can be used to good advantage in the teaching of a variety of subjects.

In the classroom the beginner is told what the shop expects of him regarding starting and stopping work on scheduled time, the care of shop property, attention to work, and the rights of his neighbor. Also, on the other hand, he is told what he may expect of the shop if he is earnest in his endeavors, and has the right attitude toward his work.

Instruction in Registering Time, Getting Tools, Etc.

From the classroom the beginner goes directly to the time-clerk, who gives instructions on registering time when starting and completing a job, and the correct job-card to use. He explains how every minute of the day must be correctly accounted for in detail on the job-cards and the total on the payroll card; that the payroll card is a bill to the company for services rendered, and the job-card is an itemized statement of work performed.

An assistant instructor, detailed for this work, next takes the beginner to the tool-crib and secures the necessary brass tool-checks and kit of tools. He explains our system of getting job-tools from the crib, and the giving of the numbered brass check as security for the loan of the tool.

A locker is then assigned to him in the washroom; he is shown where the subhospital is located; he is shown the central storeroom and the manner in which supplies are obtained with a formal requisition, and is then introduced to the instructor under whom he is going to work for the first few days.

Preliminary Machine Instruction

The introductory machine instruction is entirely oral. We find that we must repeat most of this instruction again from time to time as the operator becomes more familiar with the machine and senses the reasons for the instruction.

Dangerous places on the machine are pointed out and instruction is given on the right way to perform the work so as not to get injured. All oil holes are indicated, one at a time, and the beginner puts oil in each hole as he is shown and wipes off all surplus oil with a piece of waste. He is then shown how to start and stop the machine. The functions of the principal handles that operate the different units of the machine are demonstrated and the operator is required to move any handle indicated and to observe the result.

The operator is then taken out into the shop and machines similar to the one he is about to begin to operate are shown to him and the operations being performed are called to his attention. In this talk the technical terms of the operations and tools are used.

On returning to the training department the beginner is assigned to a machine in the department with an operator who has been on the machine for a few days. The beginner is told to ask questions freely of this operator. Questions that the older operator cannot answer he, in turn, asks the instructor. We find this arrangement to be to the advantage of the beginner, the older operator, and the instructor, because the beginner gets acquainted at the start and feels at once like a member of the organization, and not like an outsider; the older operator learns by teaching; and the instructor has another angle from which to judge the capabilities of the older operator.

At the end of two hours the beginner is taken from the machine of the older operator and assigned to a machine of his own. The instructor then begins teaching, with careful attention to detail, the first elemental operation of that particular machine.

Instruction on Machine Tools

The instructor puts a tool-bit into a toolholder and shows the correct amount of tension to give the binder screw. He hands the toolholder, toolbit, and wrench to the beginner and asks him to tighten the bit into place. He explains that too strong a pressure on the bit causes it to break in pieces, and too light a pressure permits it to slip under a cutting strain. He puts the toolholder into the toolpost and explains how to adjust the tool to the correct height, tightens the toolpost binderscrew, and points out the right wrench to use.

The instructor then takes a piece of work in the rough, and shows how to fasten on the driving dog. He brings the footstock of the lathe into its correct position and binds it securely with the proper wrench, and puts oil on the footstock center point. He places the piece of work against the headstock center point, with the driver engaged in the slot in the faceplate and instructs the operator in bringing the footstock center point up to the center hole without marring the edge of the center hole. He shows the way to judge the correct pressure to give the footstock center point in the center hole. Removing the piece of work from the lathe he asks the operator to perform these things alone.

He then explains how to present the tool to the work, cautions against whacking the tool into position with a wrench, goes through the motions correctly and asks the operator to repeat them.

Then he slowly performs the operation at hand to its completion. He repeats the operation. The beginner takes the machine and goes through the operation under the guidance of the instructor. The instructor remains with the operator until satisfied that the instruction is thoroughly understood.

This, in detail, is the way that we teach all elemental operations. Later on, when the operator has gained further experience, the manner of presenting a subject is left to the discretion of the instructor. We know that all beginners cannot be handled exactly alike and we believe in permitting the instructor to use individual judgment in certain cases. To insist on forcing the instructor to follow out a given program to its smallest details makes of him an imitator. We prefer to have him teach in his own natural way; provided, of course, that he covers all points of instruction.

One of our instructors teaches the grinding of lathe tools at the very start. His results are very good. A fellow instructor does not teach lathe-tool grinding until the beginner has been with him for two or three days. He also gets good results. The important thing about which we concern ourselves is that the operator learns to grind the tools and we do not attempt to tell either one to follow out the method of the other.

Blueprint reading is taught on the job and in the classroom. We have not as yet received a complaint to the department that a graduate was not proficient in blueprint reading.

Each instructor inspects the work as it goes through process. Certain classes of work are inspect-

ed by one of the regular inspectors directly after each operation. The completed piece receives a final inspection in the main inspection department.

The Training Plan in General

All employees in the training department work on regular shop-production work. Occasionally when an instructor wishes to illustrate a certain point and the right sort of production work is not available, he permits the operator to do the exercise on a practice piece. But this is very seldom. The work for the department is chosen with care with a view toward giving a large range of operations. The shop set-ups are duplicated and an attempt to maintain the shop production rate is made. We believe thoroughly that the success of the training department is dependent on production work, and a production speed consistent with the length of time in training.

The work is graded and promotion depends entirely on the ability of the operator. We lay stress on one thing, and that is that the beginner must do the operation habitually well before being advanced to the next step.

An examination of the operator, by the supervisor of training, is held from time to time to determine his progress. This has the effect of making the operator pay closer attention to the teaching, and serves as a stimulus to the instructor. This examination is conducted either at the machine or in the classroom. If the progress is not satisfactory, he is dismissed, or work within his ability is found for him at some unskilled occupation. The operator who shows aptitude and attention to his work is given every encouragement possible with the result that we are sending into the factory graduates who are not only skillful, but who have a pride in their work, and are satisfied workmen.

This gives a general idea of our work during the war. Our training department, like our shop and our country, is at the present moment in a period of transition from a war to a peace basis. We have been compelled, due to cancellations, to lay off some people and naturally have dropped those of little skill.

A survey just prior to Nov. 11, showed that 50.5 per cent of our producers had, up to that time, less than four months total machine shop experience, 19.5 per cent not over two months and about 15 per cent were females. These latter percentages are not cumulative, but are included in the 50.5 figure. This decision to lay off help, of course, practically wiped out the training department and gives us an opportunity to experiment on a peace basis.

The first plan we will put into operation has to do with the returning soldier and sailor. We all, without doubt, intend to make places for the men who were in the service. In many cases the particular job these men held have been filled in such a way that another disruption would work harm both to individuals and to the corporation. We intend in these cases to put the returning worker into this training department until we can properly take care of him. This is regardless of his degree of skill. If skilled, we will supply work commensurate with his skill. If unskilled, we will fit him for something better than he had before he entered the service. All of this work, however, will be temporary, that is of probably not over a year's duration.

After that will come, I hope, what I originally had in mind when our training department was started and that is the training of workers in such a way that they will have a real chance in life to become intelligent workmen, the same opportunity that many of us enjoyed because of the interest taken in us by some so-called old-fashioned foreman, an opportunity that in general exists for the beginner to-day only in the small shop.

I have in mind that speed of production is not the whole story; that gross cost is made up of many other items. I hope to teach loyalty to the United States, pride in the part played by men of the same race as the learner in the founding and upholding of this nation, in order to create a sense of possession that hitherto has been strongest in those of British descent.

I hope to try to teach men to do their own reading and their own thinking in certain matters that definitely settle whether or not they will bind themselves to the level of the crowd or will follow the paths of independence, the only road to any real success.

I hope to teach men the value of tools, time and materials and a respect for other people's property; to prove that a piece of poor workmanship hidden from possible discovery in an assembled unit is a breach of faith with the entire community whose bread and butter is affected by the reputation of a corporation's output.

I hope to teach men to do correctly those little things in a shop, the nonobservance of which causes great losses. Recently I saw a boring-mill operator, earning 80 cents per hour, reverse the direction of rotation of a reamer to back it out of a hole. In some shops he could easily have lost his job for that one act which hurts the eyes of an instinctive mechanic much as a discord disturbs a musician. But, without doubt, although he might have been a fast producer on that boring mill, no one had thought to tell him about the little things, and the instinctive mechanic is rare.

I hope to try every worker out in the training department, to embody the school idea in order to find out as soon as possible whether a man is what our impressions said he was when we hired him.

I am also frank enough to say that I will even recommend the skilled applicant not to give up his present job until both of us are sure he has every probability of making good on a new job. After the short trial he can either go back and remain on the old job if he is not the man we want, or can go back and serve a decent notice if he is the man we want. This, of course, will bring criticism from labor competitors. But it is a good thing for the man and both corporations involved, for it would cut out that part of the turnover caused by our hiring on say-so and firing on disillusionment.

The above is a big program, but it must be tackled and there is more fun undertaking a stunt that has uncertainties than the dead easy one. I believe it will work because my contact with shop men as a shop man assures me that practically every one of them responds to any plan that has right and decency on its side. I believe it will work because I was fortunate enough to be one of a number of boys who learned their trade under a foreman who practiced what I am practicing, and enough of those boys have since come up from the ranks at least a little way to prove to me that it pays.

Decreased Mill Activity

This week the Bessemer steel plant and all the finishing mills at the Brown-Bonnell works of Republic Iron & Steel Co. at Youngstown, Ohio, are shut down for lack of orders. The open-hearth plant, plate and pipe mills and other departments are running. There has been a general slowing down of operations among steel works and finishing mills in the Youngstown, Ohio, district. The three largest steel companies there, the Youngstown Sheet & Tube Co., Brier Hill Steel Co., and Republic Iron & Steel Co., were all working to nearly 100 per cent on Government orders, and since many of these have been canceled, or held up, there has been a gradual slowing down of the mills of these companies, as the commercial demand for steel is not large enough to take their full output. This condition also prevails in the Pittsburgh, Wheeling and other districts.

The first operation of the machinery in the new 110-in. plate mill of the Tennessee Coal, Iron & Railroad Co. just completed at Fairfield, Ala., was made Jan. 9 in the presence of President George Gordon Crawford and other high officials. Operations in the 26-in. shaping mill and the 40-in. blooming mill are expected to ensue shortly with the placing of the remaining machinery.

The plant of the Keystone Bronze Co. at New Brighton, Pa., was entirely destroyed by fire Saturday evening, Jan. 11, the estimated loss being $200,000. It is expected the firm will rebuild the plant as soon as possible.

FORGED TIRES AND AXLES

Present French Manufacturing Methods and Equipment—Size and Shape of Ingots

The methods and equipment used at present in France for making car and locomotive tires and axles was described in considerable detail in a recent issue of *Revue de Métallurgie* by Leon Genze, according to a translation published in the London *Iron and Coal Trades Review.*

The tire ingots are of hard steel and weigh about 143 to 154 lb., and even more, according to the specifications issued by the various railroad companies. Steel of this grade must be heated to a maximum of 1000 deg. C., and as its tensile strength is about 63.5 tons per sq. in., or more than double that prescribed for mild steel, forging and shaping it require considerable expenditure of power.

The older method is to use one ingot for each tire; in the newer method large ingots yielding six or seven tires each are used. The author is unable to give a definite opinion as to the industrial results of the new method, but describes the additional operations which the use of large ingots entails. Their cross-section is a circle or a polygon of 12 sides as a rule, with a diameter of about 19¾ in. at the base. The height of the ingot will depend on the number of blanks and the size of the tire, but should not exceed three times the diameter, plus the discard head. The weight of such ingot without the head is about 4640 lb., and will yield about seven tire-blanks of about 591 lb. each or six blanks of about 702 lb. each. The scrap in the former case will be about 22 per cent, in the latter 20 per cent or 21 per cent average of the useful ingot.

The author then estimates the extra cost of a plant for producing blanks for 150 car tires in 12 hr. from large ingots, involving the use of four lathes for cutting blanks, working night and day, and a 250-ton press. He finds that the cost of such a plant will be £17,600 (at par exchange), including land, building, all incidentals, tools, etc. Depreciation and interest are figured at 10 per cent. He calculates also the difference in cost of casting the small and the large ingots, and the difference in the cost of producing blanks from large ingots and from a single ingot, and arrives at the result that the extra cost entailed by the new method, that is using large ingots, is nearly £7 per ton. He cannot, therefore, see any reason why some of the shops have adopted the more costly new method.

Tires for Car Wheels

Car tire blanks up to 660 lb. may be prepared for rolling in a single heat; heavy locomotive tires of large diameter, however, need reheating after forging and piercing; during the second heat the shaping on the "beak" (bigornage) is carried as far as possible. The roughing and finishing are then done during a third heat. Forging presses of 1500 tons are considered not nearly powerful enough to make a good job. The 800 to 1000-ton presses used to prepare the pierced forgings for the mill are powerful enough, but more rapid and uniform work could be obtained by a continuously acting mill, with rolls, instead of the present method of using a press or hammer working on the anvil beak principle. The author has patented such a preliminary mill, but does not describe it.

The hoops thus prepared for rolling can be dealt with most economically in two entirely distinct mills, one for roughing, the other for finishing, and each driven by its own motor. The roughing mill may be driven at 60 r.p.m. by a 500-hp. motor; the finishing mill at 65 to 75 r.p.m. by an 800-hp. motor with flexible coupling. Ilgner compensating sets are used with each motor. A hydraulic pressure of 710 lb. per sq. in. is used in the roughing mill, and up to 1710 lb. per sq. in. in the finishing mill, where the tire is cooler and more resistant. A magnifying needle indicator used to check the diameter of the tire is illustrated and described. After rolling, the tire is annealed carefully at 800 deg. C., and then allowed to cool in the furnace and in the air, in accordance with the specification for the work.

Forging and Pressing Axles

Another article by the same author gives a detailed description of the forging and pressing of straight and crank axles from the ingot up to the forging ready for machining. The relative merits of different shaped ingots are discussed, and the author strongly insists on their being octagonal with convex sides and rounded off corners, and that concave sides should be studiously avoided, since these are liable to form seams or entrap inclusions when the metal is forged. Medium hard steel is used with a strength of 28.5 to 31.75 tons per sq. in. Ingots weighing about 4422 lb. net without the head or crop end, yield four car axles. The ratio of ingot weight, including the crop end and head, to weight of machined axles is 1.446, 1.37 and 1.34 in the case of ingots yielding two, three, and four car axles respectively, and 3.26 in the case of an ingot yielding two double-crank axles, the weight of the ingot in this case being about 9108 lb., including the crop end and lost head of ingot. An octagonal ingot should not be forged square before rounding; on the contrary, the corners of a square billet should be worked down to produce an octagonal section. If a square ingot be used its sides should be convex and its corners well rounded. Ingots should not be heated beyond a "yellow non-sweating" (*non suant*) heat. The furnace atmosphere should be neutral or reducing, and not oxidizing. It is foolish to try to save a pennyworth of coal and spoil ten pennyworth of steel. Octagonal billets, well forged by hammers or press, will yield 50 axles per 12 hours, compared with 30 to 35 axles per shift of 12 hours from square billets. The forgings are finally annealed in continuous furnaces at 850 deg. C. maximum temperature, and are cooled down to 500 deg. C. in the furnace and then in air.

A Floating Repair Ship

WASHINGTON, Jan. 21.—The United States Navy is to have a floating repair shop equivalent to the finest shop ashore. It will even include a brass and iron foundry.

It will be known as Repair Ship No. 1. Secretary Daniels has approved the plans for the vessel, which is included in the 3-year program of Aug. 29, 1916, and directed to be begun prior to July 1, 1919.

The repair ship has been designed after a careful study of the functions performed by similar ships in the European war and the application of the lessons of the war, particularly as regards shop facilities and storeroom capacities, has been incorporated into the design of this vessel. The vessel represents a modern, floating repair plant capable of taking care of all the ordinary repairs of the vessels of the fleet, including battleships and battle cruisers. The repair plant consists of a machine shop, brass and iron foundry, boiler and blacksmith shop, coppersmith shop, pipe and sheet metal shop, pattern shop and carpenter shop, electrical shop, drafting room, optical shop and gyro-testing room. The repair ship is about 484 ft. long over all with a beam of 70 ft. and draft of 19 ft., displacing about 10,000 tons. The battery consists of four 5-in. guns and four 3-in. anti-aircraft guns. It will be propelled by the customary steam turbines, operating through reduction gearing, and with a speed of 16 knots per hour. It will also be equipped with high power radio outfits.

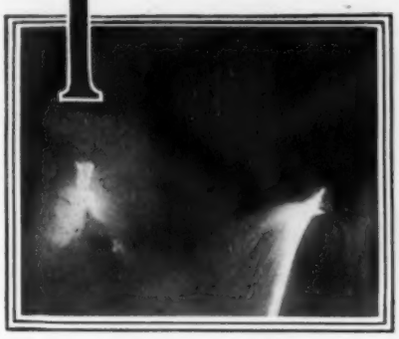
Philadelphia Foundrymen Elect Officers

The Philadelphia Foundrymen's Association, at its monthly meeting Jan. 8 re-elected the following officers for 1919: President, Thomas Devlin, Thomas Devlin Mfg. Co.; vice-president, George C. Davies, Pilling & Crane; treasurer, Josiah Thompson, J. Thompson & Co.; secretary, Howard Evans, J. W. Paxson Co.; Executive Committee: Walter Wood, R. D. Wood & Co.; Thomas M. Eynon, Eynon-Evans Mfg. Co.; H. L. Haldeman, Pulaski Iron Co.; Walter T. MacDonald, the Fletcher Works, Inc.; W. T. Dunning, Chester Steel Castings Co., Chester, Pa.

Widening Demand for Blast Furnace Slag

Uses to Which It Has Been Put—The Arguments Enumerated Again — A Possible $20,000,000 Income to Industry

BY CLARENCE E. WRIGHT



THE commercial possibilities of blast furnace slag have been known for many years in this country, but it has been in Europe that this waste material has long been commercially utilized for a wide variety of purposes. It is only recently that a really active campaign has been conducted by any blast furnace interest to develop new markets so that it may be more fully diverted to useful purposes. The Carnegie Steel Co., Pittsburgh, has a special organization which is actively seeking ways of utilizing the slag produced at all of the furnaces of the United States Steel Corporation and considerable success is attending its effort.

Among the uses which are more or less developed are the following: A concrete aggregate for reinforced concrete buildings; foundations for buildings and heavy machinery; floors, roofs, retaining walls, bridges, culverts; paving, sidewalks, curbs and gutters; dams, reservoirs; cement blocks, bricks, lintels and fence posts; cushions under brick and block pavements, top dressing and surfacing rough roads; filter material for certain chemical processes and sewage disposal plants; as a base or filter for commercial fertilizer and for railroad roadbeds.

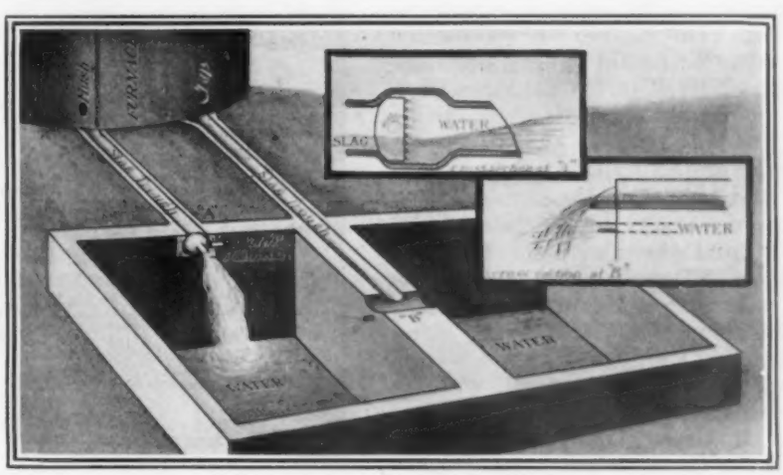
The United States Steel Corporation began the partial utilization of its blast furnace slag shortly after the acquisition of the Universal Portland Cement Co. The corporation furnaces produce annually about 10,000,000 tons of slag, but only about 1,500,000 tons of this has up to the present time been used in the manufacture of cement. About 1,500,000 tons has been used annually for railroad ballast, highway construction and as a concrete aggregate and about 250,000 tons annually has been used for filling and other miscellaneous purposes. Thus only about one-third of the total production of slag by corporation furnaces has been commercially utilized, the remaining two-thirds of the product going into dump piles.

This year there was approximately 20,000,000 tons of slag produced by all of the blast furnaces of the United States, figuring 55 lb. of slag for 100 lb. of pig iron. It probably never will be possible to divert all of this slag to commercial uses, but it is the purpose of the Steel Corporation, so far as its own furnaces are concerned, to make slag an asset rather than an expense. Up to about three years ago the railroads hauled away slag from furnaces without charge other than the freight rate which they obtained for transporting the ore from lower Lake ports to points of consumption. The Interstate Commerce Commission put a stop to this practice, however, since which there has been an extra charge for hauling away slag. At some of the furnaces of the Pittsburgh district this charge averages 50 to 60 cents a ton.

Recent prices obtained for slag in the Pittsburgh district have averaged about $1.05 a ton. While this does not allow much of a profit, it wipes out the expense incurred in dumping the slag as waste material. The price at which slag may be sold is governed largely by current market prices for crushed stone and gravel, with which it competes as a concrete aggregate and in other uses. Thus far it has not been found practicable to ship slag more than 80 or 100 miles from point of production, this being due to the fact that on longer hauls the freight rates make the delivered cost too high.

A serious problem in connection with the disposition of slag as waste, particularly in congested districts, such as Pittsburgh and its environs, is the acquiring of suitable dumping ground. Not infrequently the slag has to be moved many miles from the plant and dumped on ground bought at considerable expense and this land can seldom be used for any other purpose. Considering the cost of haulage and the expense of maintaining the dumping ground, it probably costs many blast furnaces at least $1 a ton to dispose of their slag.

The Carnegie Steel Co. in seeking new ways of commercially utilizing slag is intensively cultivating the building field. Its laboratory tests have demonstrated that slag is the lightest form of concrete aggregate available; that its strength is not surpassed by the best stone aggregate, and that its chemical composition is such that it cannot disinte-



Method Used for Granulating the Slag

Fifty Slag Concrete Houses Are Being Built by the Carnegie Steel Co. at Youngstown, Ohio, for Its Employees. Exterior finish is plaster applied direct to concrete walls and over this a finish coat of pebble dash stucco.

grate, its porous construction and decided angularity giving it superior bonding qualities. It is declared to be fireresistive because it has already gone through the fire of the furnace, and it is also an effective barrier to moisture. The sulphur content, which has been reduced to sulphides by the intense heat of the furnace, is declared to act as a preservative for the steel in reinforced concrete buildings.

Another field which is being carefully developed is the construction of roadways. It has been found that slag is an ideal material for building tar or macadam roadways, or as a cushion for brick, wood block or other paving. It has been successfully used in the construction of concrete sewers. As railroad roadbed and for other railroad work, such as station buildings, retaining walls, bridges, sidewalks, paving, etc. The Pennsylvania Railroad and other roads in the Pittsburgh district have been using slag to a large extent, as some of the accompanying illustrations will show.

Its reliability as a building material has been demonstrated by the Pittsburgh Testing Laboratories in a test which is shown in an accompanying chart.

The Carnegie Steel Co. has shown its faith in slag as a building material by using it almost exclusively in all of its construction work for some years past. The new McDonald rolling mill and the workmen's town of McDonald, Ohio, have been almost entirely constructed with slag, so far as concrete could in any way be used. This includes all the foundations for the mill buildings, pavements, sidewalks and houses in the town.

A few weeks ago a party of officials of the Carnegie Steel Co. and the Universal Portland Cement Co. went to McDonald, Ohio, to see the work done there with slag and also to inspect a number of concrete houses in Youngstown, being built for the workmen of Carnegie Steel Co.'s Ohio works. These houses, as first planned, were to have been of frame construction, but on account of the high cost J. H. Grose, Youngstown district superintendent for the Carnegie company, decided to build the houses of slag concrete with his own organization. They are of the Van Guilder type, hollow-wall construction, having two 4-in. walls with 2½ in. air space. All of the material entering into these houses was made in the plants of the United States Steel Corporation, excepting of course bathroom, kitchen and heating and lighting equipment. The total cost of a five-room house is $3,550 and of a six-room house about $3,750. Bids received for frame houses of similar type were in some instances $500 to $1,000 higher.

For commercial use the Carnegie Steel Co. makes three kinds of slag. Its granulated slag is made by running the hot material as it comes out of the furnace over a water jet, which granulates the slag as it falls into a receptacle. Most of the granulated slag made by Carnegie Steel Co. is used by the Universal Portland Cement Co. as a cement ingredient. Forked slag is simply run out of the furnace in trenches as pig iron used to be and when cool is forked out and dumped into cars. Bank slag is poured into a ladle and hauled to a dumping bank and allowed to season. Later it is dug up by a steam shovel and put through a crusher. The Carnegie Steel Co. also

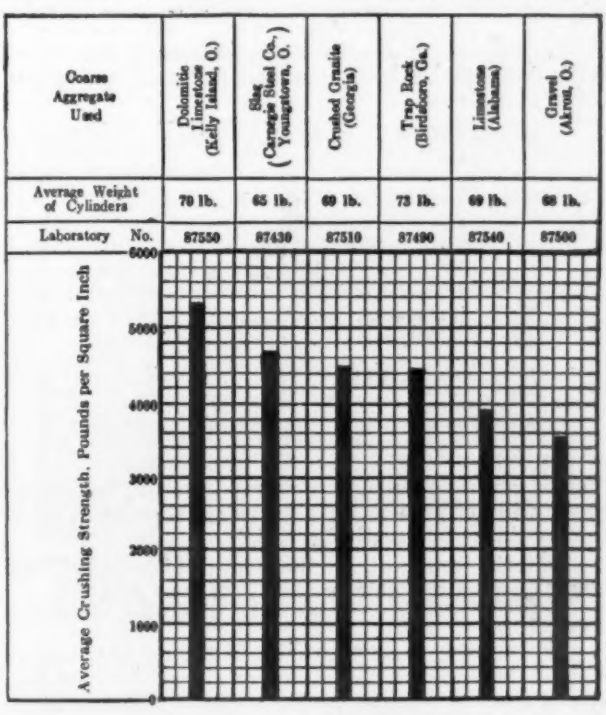
One of the Slag Concrete Houses Recently Completed by the Carnegie Steel Co. for Its Employees at McDonald, Ohio. Exterior finish is slag dash stucco applied direct to concrete walls

Streets of Slag Concrete at McDonald, Ohio

has a demand for ferromanganese slag, which because of its color, is found desirable by some of the railroads for work around stations.

There are certain economic reasons for the use of slag in place of crushed stone or gravel, which were brought to the forefront quite forcibly during the war when the Government departments at Washington were doing all within their power to conserve labor for useful and necessary work. Attempts to cut down the supply of labor for stone-crushing and digging of gravel to about 25 per cent were resisted by the men in control of these industries until it was finally pointed out to the War Industries Board that blast furnace slag was to be had in large quantities throughout most all of the eastern half of the country without any use of labor or transportation greater than would be required to haul it away to dumping grounds. These considerations may still be given weight without prejudice to the crushed stone and gravel interests. It would seem that a very large outlet for blast furnace slag might be found in the construction program for roads and other public works which is now being developed by Washington authorities.

If all of the blast furnace slag produced annually in the United States could be disposed of at an average price of about $1 a ton there would be a new income of about $20,000,000 annually from a material which is now largely going to waste. Owing, however, to the limited area in which shipments can profitably be made it is not considered probable that all of the blast furnace slag produced can be commercially disposed of, but an enlarged field of usefulness could be made to turn it from liability to a business asset.



Results of Physical Tests of Slag, Stone and Gravel Concrete. Material had aged for 2 years

Training Departments in Factories

WASHINGTON, Jan. 20.—Four large establishments have just made arrangements with the Training Service of the Department of Labor to establish training departments in their factories. These include a camera factory in Rochester, N. Y., an airplane factory in Buffalo, a great automobile plant in Toledo, and one of the largest rubber goods manufacturing organizations in the world, a corporation with 13 large factories in this country. Experts connected with the Training Service are now completing arrangements for the introduction of training courses in these factories. In the case of the rubber company, a model system of instruction has been planned whereby workmen of considerable mechanical ability will be given specialized and thorough training in a number of processes in order that they may be developed into competent training-school officials. This intensive training of shop instructors will provide a large number of men thoroughly competent to undertake any process in the plant and to impart their knowledge to others. When the supply of instructors is trained these men will be distributed among the 13 factories, so that properly equipped schools may be put into service at once.

The Matthew Addy Co., Cincinnati, will hold its annual banquet at the Queen City Club in that city on the evening of Jan. 29, to celebrate its Sixtieth Anniversary. James Albert Green, president of the company, will preside.

The name of the Warman Aluminum Casting Co., Cincinnati, has been changed to the Cincinnati Aluminum Casting Co.

COLLECTIVE BARGAINING RULES

Regulations Adopted for the Enforcement of the Bridgeport Labor Award

A detailed plan for the organization of industrial committees, and bylaws for collective bargaining between these committees and the manufacturers of Bridgeport, Conn., have been issued by the Manufacturers' Association of the City of Bridgeport.

The scheme of organization of the workers calls for the election of employees' committees of three in each plant department, from which a chairman is selected as member of an employees' general committee. Precautions to be taken at these elections are patterned after civil elections and require that candidates have a minimum of three months' service with the company immediately preceding election.

Oversight of the whole plan is to be maintained by the local representative of the National War Labor Board, the plan providing that:

The judges of election for the first election shall be an examiner or other non-partisan representative of the National War Labor Board and two or more employees chosen by him from the department or section involved, one of whom shall be, whenever possible, the timekeeper of the department who will serve as checker of those voting, or some employee qualified to recognize the employees voting as bona fide employees of that department. Such judges shall hold the election, count the votes, certify the returns, and announce, at the earliest possible hour, the names of those elected.

That the initiation of the whole scheme shall take place only under the eye of the Government representative, it is further specified:

The first election shall be held at such time as the administrative examiner shall decide, and at such place as in his opinion the greatest number of votes of the eligible employees would be obtained. Such employees will be given a printed ballot and a free opportunity to vote in accordance with their wishes and choice. The privilege of an absolutely secret ballot shall be guaranteed and enforced.

During the actual time covered by the elections, all foremen, higher officials, employees of other departments and non-employees shall absent themselves from the place of election, except for good and sufficient reason under the personal supervision of the National War Labor Board's representative.

This supervisory attitude is carried out in the formation of the employees' general committees, representing each plant under the award, and made up of the several chairmen of the department committees, which if too large for efficient working, may itself elect an employees' executive committee to the number of 3, 5, 7 or 9, as decided in advance by the administrative examiner and done under his guidance according, as follows:

Whenever at the initial election it is found advisable to elect an executive committee said general committee shall be called together by the administrative examiner and presided over, for this one purpose only by an Examiner, or other non-partisan representative of the National War Labor Board who shall see that the election of said executive committee is conducted in accordance with such instructions as the administrative examiner may issue in order to insure a fairly elected and representative executive committee.

The by-laws carefully limit the jurisdiction of the department employees' committees as regards conference with the plant management, and in respect to the operation of the recent War Labor Board award in Bridgeport, it is stated:

Department committees may adjust with the management, by agreement, whether presented by appeal, reference or initiation, all questions in reference to the correct and proper application of the Bridgeport award, including the rulings and interpretations thereof, as made by the local examiner, to the employees, individually or collectively, of their respective departments, with the proviso that the rights of appeal guaranteed by the award, including said rulings and interpretations, shall not be in any way denied. Power to alter, change, or add to the rulings and interpretations of the award as made by the local examiner is not vested in any committee.

After the initial election rules or regulations pertaining to these various committees may be decided by a two-thirds vote of the entire ranking joint committee.

The conferences, elections and other sessions for carrying on the work are to be held outside of working hours, except otherwise by consent of the management; and where conferences are requested by a department committee with the management, it is agreed that it shall be held not more than six working days after the date requested. Referendum and recall provides the workers with means for eliminating unsatisfactory department committeemen.

In case of disagreement between the representatives of the company and the workmen it is provided as follows:

In case the general or executive committee in joint conference fails to reach an agreement, before other action shall be taken, said committee shall refer the matter in question to the highest executives of the plant management for consideration and recommendation.

Pig Iron Prices After Wars

Eliot A. Kebler, special representative at Pittsburgh of the Matthew Addy Co., has sent to Judge E. H. Gary, chairman United States Steel Corporation, the following statement as to pig iron prices after wars and shortage of pig iron capacity shown by comparison with steel:

Advance in Pig Iron Prices After Wars

Russian-Japanese War

War declared Feb. 10, 1904—Valley Bessemer	$12.64
War ended Sept. 9, 1905—Valley Bessemer	14.95
Price May, 1907—Valley Bessemer	23.28

Spanish War

Really began January, 1898—Valley Bessemer	$9.12
War declared April, 1898—Valley Bessemer	9.66
War ended August, 1898—Valley Bessemer	9.60
Price December, 1900—Valley Bessemer	24.20

Franco-Prussian

War declared July 10, 1870—No. 1 foundry, Philadelphia	$32.75
War ended May, 1871—No. 1 foundry, Philadelphia	35.50
Price June, 1872—No. 1 foundry, Philadelphia	53.37

Civil War

October, 1862—No. 1 foundry, Philadelphia	$18.61
August, 1864—No. 1 foundry, Philadelphia (gold basis)	29.44
Average year 1866—No. 1 foundry, Philadelphia	46.67

Shortage of Pig Iron Capacity Shown by Comparison with Steel

	Jan. 1, 1914	Jan. 1, 1919	Increase
Steel	37,000,000	52,500,000	36 per cent
Pig iron	40,000,000	44,000,000	Only 10 per cent

This is also shown by a comparison of production with the doubling of output each 10 years, in million tons, as follows:

10 Year Periods	Tons Made	The Doubling Rule
1850-9	6.4	6.2
1860-9	10.5	12.4
1870-9	21.9	24.7
1880-9	51.5	49.5
1890-9	93.5	98.9
1900-9	197.8	197.8
1910-19		395.6
1910-18	281.8	
1919 say	44.0	
Less 1910-19 say		325.8

Apparent shortage Jan. 1, 1920, say, in million tons, 70

Mr. Kebler adds:

"Of course, even the strong pig iron position shown above will not prevent the temporary recession in price during the reconstruction period."

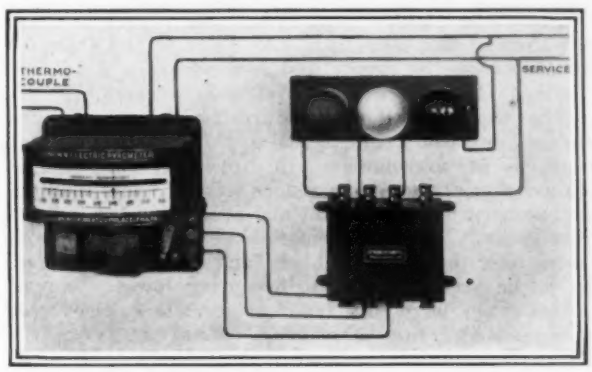
Editorial comment on the above statistics will be found elsewhere in this issue of THE IRON AGE.

The monthly meeting of the Cleveland district section of the Association of Iron and Steel Electrical Engineers, will be held at the Hotel Statler, Cleveland, on Saturday, Jan. 25. The subject is to be "Telautograph."

Automatic Signaling Pyrometer

The temperature scale of an instrument is meaningless to many employees, and it has become necessary to use some other means to indicate to the furnace operator whether its temperature is correct or too high or too low. In the largest plants it has been the policy to signal by lights from a central station. Three lights are grouped at each furnace: green to indicate the temperature is too low; white that the temperature is satisfactory, usually within a limit of 10 deg., and red that the temperature is too high. The white light burns while the temperature is correct; as soon as it rises or falls more than 10 deg. either side of the desired temperature the operator at the central station flashes the green or red light and extinguishes the white. Any employee can be instructed to keep the white light burning and what to do when the red or green light appears.

To save the expense of an operator's time and of the wiring installation, and also to take care of the plants which have a small number of furnaces, the



This Electric Pyrometer Automatically Operates Colored Signal Lights to Indicate the Furnace Temperature to the Operator

Brown Instrument Co., Philadelphia has developed an instrument to operate the signal lights automatically from a pyrometer.

A table, adjustable throughout the whole scale range, carries three contacts corresponding to the three lights, the central contact operating the white light, usually covering a space of 20 deg. on the scale, amounting to 10 deg. plus or minus of the desired temperature. The pointer on the pyrometer is automatically depressed once a minute on tungsten contacts. An automatic 3-position relay operates by the closing of the contacts in the instrument.

It is frequently desirable to incorporate a hand-operated switch with the instrument so that the temperature of the thermo-couple in a furnace may be automatically signaled and the temperature of other thermo-couples may be read on the scale by some qualified official.

By introducing an automatic motor or clock-driven switch in connection with a pyrometer, the temperature of practically any number of thermo-couples can be automatically signaled by one instrument. The company constructed a standard instrument operating lights at 12 furnaces in this manner.

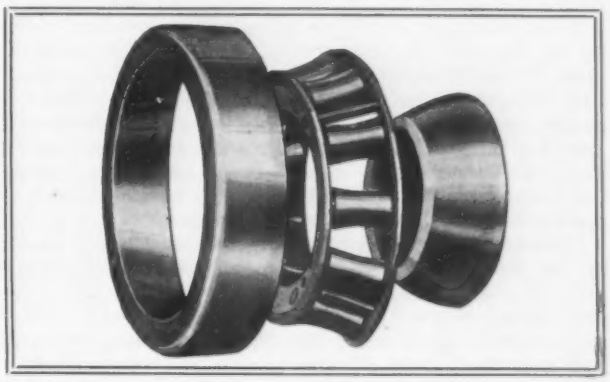
Another recent development is an automatic advancing mechanism driven by clock work causing the contacts to advance at a predetermined speed across the scale. In certain processes, for example kiln-firing, the temperature must be advanced slowly at a predetermined rate. The signal lights can be operated in this manner to indicate by the burning of the white light when the temperature is advancing at the desired rate, or to show by the red or green light when this condition fails.

This type of instrument is applied to the automatic control of temperature either with electric switches for electric furnaces or with valves to control steam, gas or oil. The instrument which automatically signals the temperature by lights can also be arranged to automatically control the temperature at the same time with suitable switches or valves. In the standard instrument of this kind the clock mechanism advances the contact point across the scale to the maximum temperature desired within any time limit specified, and this speed can be increased or decreased 10 to 20 per cent by a gear-shifting device if it is found that the rate of heating can be changed to advantage.

These instruments represent a radical step in pyrometers for unskilled labor, for whether the temperature be signaled by lights or whether it be automatically controlled, the maintaining of the correct temperature becomes entirely automatic.

Roller Bearings for Thrust and Radial Loads

A front wheel bearing that departs from the usual type of roller bearing design has been placed on the market under the name Shafer roller bearing by the George D. Bailey Co., Chicago. This design aims to eliminate the chief source of front wheel bearing trouble, namely the inability to take a heavy thrust



Roller Bearings Designed for Thrust and Radial Tools

(sideway) load without damage to the bearing and take care of axle spindle deflection as well.

The outer surface of the inner cone is convex, having the contour of a perfect ball, and the rollers possess a concave surface, thereby forming a cradle for the cone and allowing it to swing to meet any deflection of the spindle when out of alignment. The cone being free to move with the spindle and the load being taken upon the full length of the rollers causes no strain or binding of the bearing itself.

The concave surface of the rollers presents an equal load-carrying surface both from the side as well as the top, and therefore the bearing is able to accept thrust (sideway) loads equally as well as radial (downward) loads.

Unfair Methods Alleged

WASHINGTON, Jan. 20.—The Federal Trade Commission has filed a complaint against the Brown Portable Conveying Machinery Co., Chicago, declaring that it has reason to believe that the defendant corporation with the "intent, purpose and effect of hindering, embarrassing and restraining" the business of its competitors during the last three years has threatened certain of its competitors with patent infringement suits, although it has never instituted such suits or even intended to begin them. The company has been cited to answer Feb. 24. The commission has also filed complaints against the New Jersey Asbestos Co., Stewart Dickson & Co., Inc., and Wall Rope Works, Inc., charging them with giving gratuities to employees of customers.

Another truck operating efficiency test has been announced by the Packard company. It begins on Feb. 1 and ends Jan. 31, 1920, a period of one year. Cash awards of $17,640 are offered drivers, shipping clerks and accountants. Operating, maintenance, cost and load data are to be submitted on forms of the national standard truck cost system, which is calculated to show owners what they were getting out of their trucks in the way of work and how much it costs to do that work.

Number of Unemployed Is Steadily Growing

Surplus in Industrial Centers Is Causing Anxiety — American Federation Has Long Program — Senator Kenyon Proposes Conference of Governors

WASHINGTON, Jan. 21.—They are talking in Washington of breadlines, for the labor situation throughout the country is rapidly growing worse. A month ago, the Labor Department officials and the labor union leaders tried to paint things in a rosy hue, to bolster up their claims that there was no occasion for lowering wages merely because the war had ended and with it had ended the emergency that had doubled and trebled the payroll items. The mere threat of a strike, they thought then, would force employers to pay wages which the market price of products could never justify.

They talked glibly then of the speed with which the industries would absorb the demobilized soldiers and the war workers who were being thrown out of work by the cancellation of contracts. They talk differently now. Demobilization is still only in its initial stages. Less than a million men have left the army. Yet already there is a daily increasing surplus of workers, and the United States Employment Service is straining every nerve in the hope that it can keep up with the situation. The wage question has become less important—it is a case of finding jobs now.

The statistics which are being compiled every week by the Employment Service, fragmentary though they are, tell a dramatic story of the speed with which this problem is growing. Fifteen states are now listed in the column of states in which the shortage of employment has kept thousands of men in the unemployed lists. They include the states which contain the nerve centers of our industrial problems. The roll of 15 is made up of California, Colorado, Connecticut, Illinois, Indiana, Iowa, Michigan, Massachusetts, Nebraska New Mexico, New York, Oklahoma, Oregon, South Dakota and Utah.

Boston reports a surplus in the building trades; Worcester, Mass., has 5000 more applicants than jobs. Lawrence, Mass., reports an increase in the layoffs. Connecticut's surplus of labor is growing, although there is a slight demand for sheet metal workers and molders in Stamford. Rhode Island reports a slight reduction in working forces and there is a demand for machinists—though not large—from New Hampshire. Maine can use 2000 woodsmen.

Surplus in New York

New York state reports a surplus of 26,000 workers, but these figures take no account of the daily increasing files of the unemployed in the streets of New York City. Buffalo alone has a surplus of 13,000 workers, Syracuse, Rochester, Utica, Binghamton and Albany also have more men than jobs. New Jersey reports supply and demand of labor about equal, with slight surpluses in Paterson and Elizabeth. Most significant, however, is the statement that there is a lessening demand for shipworkers, molders, boilermakers and railroad workers.

Pennsylvania continues the only large state with a demand for workers, but here also the demand is growing smaller, particularly in Philadelphia. Erie reports a surplus. The heaviest demand in the state is for coal miners and laborers, with a fairly strong demand for blacksmiths, carpenters and railroad and shipworkers.

Ohio brings in the most pessimistic reports. Cleveland alone now has a surplus of 40,000, and nowhere in the state do the conditions promise any immediate improvement. Michigan has the same condition. Detroit now has jumped by 5000 to a total of 25,000 more workers than places. Indiana reports a surplus of 4000 workers in Indianapolis and South Bend. Illinois reports an increase in the men thrown out of work, with only the demand for woodsmen and railroad workers to absorb them.

Missouri has joined the ranks of the States reporting a surplus of workers. Utah, Nebraska and Colorado face the same problem. Oklahoma is planning a State convention to discuss the resumption of public improvement work to help out the situation.

South Needs Workers

In the South there is still more work than workers. Alabama wants coal and ore miners, Georgia wants labor and textile workers, with a particular demand for shipworkers at Savannah. Virginia reports a lessened shortage of workers, North Carolina still has room for help, but Kentucky reports a surplus of workers.

From the Pacific coast comes the report of labor surpluses in San Francisco, Los Angeles and Oakland. Seattle announces supply and demand about equal, but Portland, Ore., has a surplus of 6000 workers.

The wage question is disturbing the labor union leaders here, who begin to feel apparently that a break in wages is unavoidable. In November they fought against every proposal to reduce wages. Now they see the handwriting on the wall and are trying "to get out from under." But they report that they have less influence over the union members, and that in many cases the latter prefer strikes to accepting lowered wages. Almost every large city reports a growth in the strike sentiment, and this is causing special worry to the Government officials, because with it comes a threat of Bolshevism. The increasing unrest in Europe and the Bolshevistic difficulties in South America have all had their effect in increasing unrest in the United States.

Labor Board's Efforts

The National War Labor Board is still trying to figure in the strike situations, but its influence is almost gone. Only Presidential direction put it into the New York harbor situation. The Bethlehem Steel Co. has broken openly with the board over the enforcement of its awards made last fall. The General Electric Co. seems to be settling with its workers on its own terms, and it is reported here that the rehiring is being done on the basis of the 1914 wages and conditions, so that the strike of the workers in its factories netted them nothing.

Cities like New York and Chicago are feeling most heavily the difficulties of demobilization. Already the streets of New York reveal thousands of discharged soldiers who are looking for work there instead of in their native cities. Despite the orders of the War Department that soldiers are to be demobilized in the camps nearest their homes, there are great numbers who succeed in making their way to New York, either because it is on their way home, or because they are within striking distance of that city and want to use the opportunity to try their luck there. This has an added complication because there are still many thousands of New York boys overseas who will find their places gone when they return.

During the week the American Federation of Labor leaders made public a long program of labor demands, which centered about an insistence that present wages must be maintained and that there must be no recession from war conditions or war wages. To accomplish this they mapped out a lot of labor politics. At the same time, Frank Morrison, secretary of the Federation, appeared before the immigration committee of the House to warn it that there would be bread lines by May at the present rate of increasing unemployment. His suggestion was to shut off immigration for four years to hold up American wage standards. He also asked that the soldiers be kept on the Government payrolls until they had found work, that a greater public improvement program be worked out, and that Sec-

retary Lane's plan to get the soldiers onto reclamation projects be put into practice.

Public Improvements

The Department of Labor still is trying to make propaganda for its public improvement campaign. But the fact that states and municipalities seem unwilling to undertake such enterprises at the present high state of the material and labor markets and that there is also difficulty in raising money in competition with Liberty loans has hampered the plan.

The Employment Service has been putting its machinery into operation for a more comprehensive listing of all the employment opportunities in the country. By far the largest share of the nation's soldiers came out of the smaller industrial plants, the larger corporations apparently being more anxious to protect their men by asking exemptions. Therefore, if the men are to be put back to work they must be routed back to these smaller plants. And so far the Service has not been able to make up a comprehensive survey of their needs. For that reason it is undertaking an extensive advertising campaign to reach the smaller employers of labor. It has made up a special blank which it is asking every employer to fill out and to send either to the Employment Service representative in his own city or to the Federal Employment Service Director in his state. The latter have worked out an elaborate clearance plan so that the labor requisitions will immediately be put into the hands of the divisions where there are labor surpluses.

The Employment Service

The following list of the Federal Directors of the Employment Service for each state, with their addresses, is of particular value to every industry that is willing to co-operate with the United States Employment Service in giving work to demobilized soldiers and other workers. The IRON AGE publishes it here at the request of the Employment Service:

Alabama—George B. Tarrant, 516 Empire Building, Birmingham.
Arizona—Thomas J. Croaff, 34 South Central Avenue, Phoenix.
Arkansas—R. B. Keating, Main and Markham streets, Little Rock.
California—William T. Boyce, 806 Claus Spreckels Building, San Francisco.
Colorado—Roady Kenehan, Barclay Block, Eighteenth and Larimer streets.
Connecticut—Leo A. Korper, State Capitol, Hartford.
Delaware—A. G. Benkhart, Old Federal Building, Wilmington.
District of Columbia—E. M. Kline, 1410 Pennsylvania Avenue, Washington.
Florida—Walter A. Dopson, 226 West Bay Street, Jacksonville.
Georgia—H. M. Stanley, 318 State Capitol, Atlanta.
Idaho—M. J. Kerr, St. Anthony.
Illinois—Mark L. Crawford, 116 North Dearborn Street, Chicago.
Indiana—Louis C. Huesman, Statehouse, Indianapolis.
Iowa—A. L. Urick, 422 Court Avenue, Des Moines.
Kansas—J. Will Kelly, 515 Mulvane Building, Topeka.
Kentucky—W. Pratt Dale, Lincoln Bank Building, Louisville.
Louisiana—Hans A. M. Jacobsen, 803 Audubon Building, New Orleans.
Maine—Charles S. Hichborn, Blaine Mansion, Augusta.
Maryland—John K. Shaw, 26 Commerce Street, Baltimore.
Massachusetts—Everett W. Lord, 18 Tremont Street, Boston.
Michigan—James V. Cunningham, 101 Fort Street West, Detroit.
Minnesota—Hugo Koch, 1620 Pioneer Building, St. Paul.
Mississippi—H. H. Weir, Mazza Woods Building, Meridian.
Missouri—W. W. Brown, 1021 Grand Avenue, Kansas City.
Montana—Scott Leavitt, 301 First Avenue North, Great Falls.
Nebraska—George J. Kiegner, Douglas County Courthouse, Omaha.
Nevada—J. C. Coniff, 26 East Commercial Row, Reno.
New Hampshire—E. K. Sawyer, 442 Centre Street, Franklin.
New Jersey—Lewis T. Bryant, State Capitol, Trenton.
New Mexico—D. A. McPherson, 312 West Gold Avenue, Albuquerque.
New York—Henry Bruere, 469 Fifth Avenue, New York City.
North Carolina—George J. Ramsey, 319 Fayetteville Street, Raleigh.
North Dakota—Lindley H. Patten, 3 Broadway, Fargo.
Ohio—Fred C. Croxton, 74 East Gay Street, Columbus.
Oklahoma—C. E. Connally, 2 East Grand Avenue, Oklahoma City.
Oregon—Wilfred F. Smith, 75 Third Street, Portland.
Pennsylvania—E. C. Felton, Finance Building, seventh floor, Philadelphia.
Rhode Island—Edwin A. Burlingame, Statehouse Annex, Providence.
South Carolina—John L. Davis, 502 Loan & Exchange Bank Building, Columbia.
South Dakota—Charles McCaffree, Federal Building, Pierre.
Tennessee—Joseph T. Ware, 732 Stahlman Building, Nashville.
Texas—H. W. Lewis, 220 Bedell Building, San Antonio.
Utah—P. J. Moran, 307 South Main Street, Salt Lake City.
Vermont—Robert W. Simonds, Main and State streets, Montpelier.
Virginia—James B. Botts, Va. Passenger & Power Co. Building, Seventh and Franklin streets, Richmond.
Washington—Lawrence Wood, 110 Cherry Street, Seattle.
West Virginia—Lemuel B. Spaun, 811½ Kanawha Street, Charleston.
Wisconsin—George P. Hambrecht, State Industrial Commission, Madison.
Wyoming—Ed. P. Taylor, Annex Block, Seventeenth and Capitol Avenue, Cheyenne.

Senator Kenyon of Iowa has suggested the calling of a conference of governors to work out a program of labor employment. In announcing this suggestion, Senator Kenyon declared that he had information that there were 200,000 unemployed in the United States. He wanted the conference held while the State Legislatures are still in session, so that they can carry out the programs that may be agreed upon. His solution centers chiefly about an increase in public works. Senator Weeks of Massachusetts also pleaded for greater public improvement programs, and Senator France of Maryland had an amendment inserted in the census bill to have a census of unemployment made in connection with the 1920 census.

O. F. S.

War Trade Board Wiping Out Restrictions

WASHINGTON, Jan. 21.—The War Trade Board is continuing its policy of wiping out long lists of import and export restrictions. But American commerce is still far from a point where it can take advantage of the great opportunities offered by foreign markets. The shipping difficulties to most ports of the world are still in a highly chaotic state. Particularly is this true of Central and South America, where the British steamship lines still offer lower rates and better sailings from Liverpool than our exporters are able to secure from New York.

The Shipping Board has released some of the important restrictions on overseas commerce, and the War Department has been giving up requisitioned ships, but all this has not proved enough to make the situation decidedly better.

The War Trade Board has cut off most of the restrictions on exports. The latest Export Conservation list contains only 90 items, mostly foodstuffs. Arms and ammunition are the only items of the iron and steel industry that are left.

On the import side of the ledger the War Trade Board has canceled all restrictions on the importations of iron ore, chrome ore, manganese ore, monazite sand, copper ore and copper concentrates. It also announced that it would issue licenses for the importation of ferromanganese from Great Britain to cover shipments which were contracted for by American consumers prior to April 6, 1917. The affidavit of the importer or the written statement of the consumer of the existence of the contract, it declared, would be sufficient evidence.

The harbor workers' strike in New York tangled the export situation more than ever. According to the United States Railroad Administration the shipping tonnage in sight will cover about 60 per cent of the export demands in sight. It reports that both the British and French Governments face a shortage at the port of Boston, the latter having no ships in sight, although the British will be able to take care of their own cargo requirements.

Handling Machinery Builders Organize

Association Formed Which Will Co-operate with United States Government in Developing More Improved Methods at Marine Terminals

THE Material Handling Machinery Manufacturers' Association was organized on Thursday, Jan. 16, at the Hotel McAlpin, New York, to co-operate with the United States Shipping Board and other Government agencies in improving freight-handling facilities on merchant ships and at terminals, so that the American merchant marine can operate with the least possible loss of time in discharging and loading cargoes.

With a charter membership of 25 companies, the association is believed by its sponsors to be an assured success, though it probably will require a few months of organization work to obtain a substantial and thoroughly representative membership. The association embraces five distinct lines of freight-handling equipment, and this diversity presented one of the problems of effecting a smoothly working body of somewhat competitive, though not necessarily conflicting, interests. These five divisions are as follows: 1. Cranes, hoists and winches. 2. Power and gravity conveyors. 3. Elevators. 4. Trucks, trailers and tractors. 5. Bulk-freight handling machinery.

At the organization meeting the following board of governors, numbering eight members, which later will be expanded to 12, was elected: C. M. Watson, Watson Elevator Co., New York; William Clarke, Manning, Maxwell & Moore and Shaw Electric Crane Co., New York; R. W. Scott, Otis Elevator Co., New York; F. W. Hall, Sprague Electric Works, New York; Fred Stadleman, Wellman-Seaver-Morgan Co., New York; Lucien Brown, Elwell-Parker Electric Co., Cleveland; James A. Shepard, Shepard Electric Crane & Hoist Co., Montour Falls, N. Y.; John C. Walter, Alvey-Ferguson Co., Cincinnati. Officers will be elected at a meeting of the board of governors on Thursday, Jan. 23.

JAMES A. SHEPARD

President Shepard Electric Crane & Hoist Co., Temporary Chairman of Material Handling Machinery Manufacturers' Association

Secretary Redfield a Speaker

James A. Shepard, president Shepard Electric Crane & Hoist Co., Montour Falls, N. Y., presided as chairman at the convention, which consisted of a preliminary meeting on Wednesday afternoon, at which the plan of organization was outlined, and a luncheon Thursday at which Secretary of Commerce Redfield was the guest of honor and principal speaker.

Secretary Redfield pointed out that our methods of handling freight at ocean ports are woefully inadequate and antiquated. He said that if ore boats on the Great Lakes lost as much time loading and unloading cargoes as do the boats engaged in oceanic trade, the great American steel industry would not be possible. He urged the Material Handling Machinery Manufacturers' Association to appoint a committee which would work in co-operation with the Department of Commerce in solving the problem of handling freight with such rapidity that much of the high cost of operating the American merchant marine could be eliminated. He stated that it is not the cost of operating ships that counts against the American merchant marine but the cost of keeping ships idle.

Handling charges at terminals, Mr. Redfield said, are the biggest expense—and also the biggest waste—in transportation. He went so far as to say that he believed this to be one of the greatest American wastes. Although the United States has developed transportation to the highest power, so that the cost of moving freight is ridiculously low as compared with other countries, the cost of handling the freight at terminals remains as a tremendous and unnecessary expense. He said that we handle lumber as the ancient Carthaginians did; that we still use the hand truck and the horse truck, and that despite the fact that American ingenuity has devised freight-handling machinery of all sorts and for all purposes, we still man-handle freight at many of our ocean ports.

He referred to the cartage waste, saying that it costs more to put a barrel of flour on a truck in Chicago than it does to transport it from Chicago to New York, and the cost of putting it on a ship in New York is greater than the transportation charge to Liverpool.

Mr. Redfield drew several comparisons between methods on the Great Lakes and on the ocean. He said that the Great Lakes steamship is the cheapest carrier of freight in the world and has successfully demonstrated that an American merchant marine can pay American wages and provide American food and American working conditions for its seamen if the problem of loading and unloading freight is properly solved. In the eight months of the year in which Great Lakes boats can operate they spend more time in operation than ocean vessels do in their full season of 12 months. This is due, he said, to the vastly superior methods of handling freight on the Lakes by which vessels are enabled to unload a cargo of ore at a lower Lake port and take on a cargo of coal in a few hours, compared with the several days usually required by an ocean-going vessel. While admitting that the problem of handling bulk cargoes such as ore, coal and grain on the Lakes is simpler than the handling of miscellaneous freight at ocean ports, he asserted that the same principles could be adapted to ocean terminals with a saving of possibly two days or more in the turn-around of a vessel in port.

At the port of New York, Mr. Redfield said, boats were being loaded and unloaded much in the same manner as were the Dutch sloops which first went up the Hudson River in the days of Hendrick Hudson.

"I don't know whether we can build ships as cheaply as Europe," said Mr. Redfield, "but we can handle ships more cheaply than European countries if we apply American ingenuity to the problem of loading and unloading freight." He said that many people might say that European countries would simply adopt our methods, but in contravention of this he said that Europe had not adopted our much more efficient locomotives and that it had not imitated our structural steel industry.

Great Opportunity for Efficient Apparatus

Secretary Redfield pointed out these conditions as indicative of a great opportunity which is now before the manufacturers of material-handling apparatus. He said that more improved methods must be installed on ships as well as at wharves; that ships must be constructed of such design that cargoes can be loaded and unloaded quickly; that wharves must not be used as

warehouses for the storage of merchandise, and that whole plants must be devised for the rapid handling of freight at ocean ports. His solution of the problem is to apply continuous conveyor methods so that freight could be unloaded from ships, loaded onto cars or trucks, and all done by machinery in one operation without the man-handling now employed.

Mr. Redfield promised the co-operation of the Department of Commerce in the work the Material Handling Machinery Manufacturers' Association will undertake. He said that investigations of port facilities in the harbors of the world would be conducted by the Government if an organization requested it, thus opening up to the manufacturers of handling machinery the opportunities that exist throughout the world for the sale of their apparatus. Moreover, the Department of Commerce will assist in the research work or experiments necessary to develop the best types of machinery for various purposes; through the Bureau of Standards and the American Society of Testing Materials, it will assist manufacturers in arriving at definite conclusions regarding the best materials and best methods.

New Laboratory of Bureau of Standards

Mr. Redfield referred to the new laboratory of the Bureau of Standards in Washington, a manufacturing building covering six acres and constructed at a cost of $1,130,000, which is equipped with nearly every type of machinery for experimental work. He said that if a machinery manufacturer wanted to know, for example, the effect of certain alloys on the hardness and wearing qualities of steel the Bureau of Standards would conduct the necessary experiments without cost to the manufacturer. It will do the work in its Washington laboratory, or under some conditions will send technical experts to the manufacturer's plant. A thousand men and women are now employed in the Bureau of Standards laboratory in various forms of industrial research.

Another form of Government co-operation outlined by Mr. Redfield is the standard specifications for manufactured products which are being worked out by the Bureau of Standards, with the co-operation of the Department of Commerce and the American Society of Testing Materials. At present there are under consideration 62 sets of standard specifications in the iron and steel line alone, and of these 13 are now ready for use. They are being printed in Spanish and will be widely circulated among buyers in Latin-American countries. By the use of these specifications, a buyer in South America can order a hoisting engine, for example, of certain specifications merely by cabling a code designation or specification number.

Mr. Redfield said that the Government wants the co-operation of industries in building up a foreign trade and that the country needs organizations of business men through which the Department of Commerce and other Government departments can work. He said that the progress of industry is toward co-operation and away from secrecy and individual dealing. Individual initiative should not be destroyed, but a form of co-operation which would aid and foster individual initiative is needed in American business.

Broadly, Mr. Redfield's message was that there is need of and a field for such an organization as the Material Handling Machinery Manufacturers' Association and that it can do much toward aiding the American merchant marine and also the American railroads in eliminating economic waste due to inefficient handling facilities at terminals.

Other speakers at the luncheon were Calvin Tompkins, former dock commissioner of New York, and J. W. Frazier of the engineering staff of the Ports and Harbors Facilities Commission. The latter said in part:

Purposes of the Organization

The movement for an organization of the material handling machinery manufacturers was inaugurated last fall, at which time meetings were held in the office of E. F. Carry, chairman of the Ports and Harbors Facilities Commission, United States Shipping Board. Mr. Carry indicated at that time the desire of the United States Shipping Board to have the facilities for handling freight at marine terminals improved so that economies in time and operating cost would be effected which would prove a material aid to the mercantile marine being developed by our Government. The announcement of the organization meeting stated that the objects of the association would be as follows:

It will afford a means for the co-operation of all manufacturers of material-handling machinery with the U. S. Shipping Board, port and harbor commissions, railroad commissions and other boards interested in material handling.

It will afford a means for extending the acquaintance of manufacturers' representatives, as well as co-operation among the manufacturers, stimulating interest and promoting more friendly relations.

A concentration in a general bureau of statistics of information covering the present state of the art of mechanical handling of materials, as now practiced in this country and abroad.

The dissemination among the members of information collected and developed by the association.

The dissemination of educational propaganda which will extend the use of material handling machinery and remove the obstacles now tending to impede its progress.

Also providing facilities for collecting information with reference to foreign trade opportunities and a means of studying the requirements and keeping the manufacturers fully informed.

It has been the definite opinion of the organization committee that the association should not take up any matter affecting the commercial relations of its members, or with prospective purchasers of equipment. This condition can best be met by the direct dealing of the individual manufacturers with the prospective purchasers.

Things on the other side may be pretty much shot to pieces, but the people over there have not gone out of business and we cannot sell our goods without competition. We have got to meet the other fellow's prices, perhaps, figuratively speaking, not to-day, but surely to-morrow. How are we going to meet this competition? By merely increasing the number of our ships? No, we must improve our port and terminal facilities and, above everything else, we must not go on and on in the same antiquated way of handling our freight. This handling not only applies at marine terminals, but all railroad terminals and warehouses, yes, and away back to the factories, or any place where quantity of production will warrant improved handling facilities.

Your organization can be most helpful. Terminals and warehouses without number are your field of action. We welcome your suggestions and all schemes submitted will receive our most careful consideration.

Licensing of Engineers

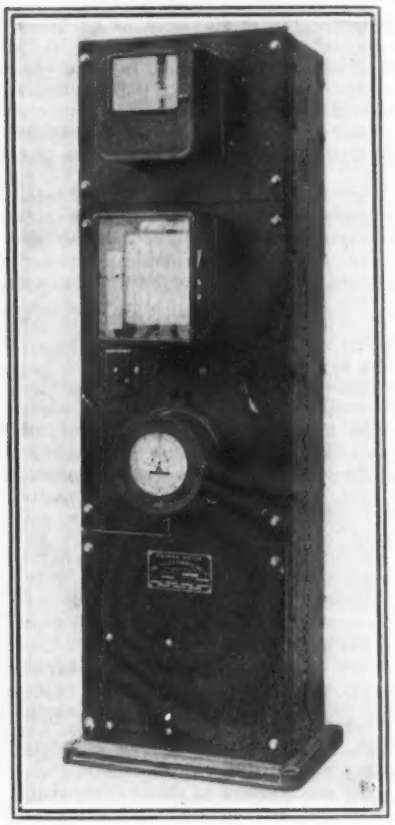
Members of the Ohio Engineering Society on the first day of its annual convention in Columbus, voted unanimously in favor of the principle of licensing engineers. It is expected that a bill will be presented to the State legislature at its present session. The action of the society followed an address on "Licensing," by C. E. Drayer, secretary American Association of Engineers.

President Clyde T. Morris of the Association of Ohio Technical Societies announced a plan for the study of the subject of licensing by all engineering organizations of Ohio in order that a generally acceptable bill may be drafted. He has called upon the societies composing the Ohio association to name committees on licensing. A conference will be called at Columbus n the near future for discussion and the drafting of the bill.

The Indiana members of the American Association of Engineers will meet jointly with the members of other engineering societies at the Claypool Hotel, Indianapolis, Thursday evening, Jan. 23, to organize support for the Indiana engineers' license law. Prof. R. C. Yeoman, Purdue University, state chairman, will preside. H. O. Garman, chief engineer Indiana Public Service Commission, will speak on "Engineers License Laws." C. E. Drayer, secretary American Association of Engineers, will speak on "Local and National Societies Co-ordinated." W. H. Finley, president Chicago & Northwestern Railroad, will give an address on "The Relation of the Engineer to Social and Business Problems." The committee chairmen appointed are: Legislative, M. T. Calef, South Bend; executive, Prof. C. Francis Harding, Purdue University; membership, W. H. Salwasser, Gary; publicity, Robert M. Feustel, Fort Wayne.

New Thomas Meter Instrument Panel

In order to make possible the installation of the recording instruments used in connection with the Thomas meter, where the superintendent or coke oven and open-hearth operators may conveniently refer to them, the Cutler-Hammer Mfg. Co., Milwaukee, has developed a new instrument panel. The instruments are now mounted on a separate small panel and the regulator may be installed in some other location convenient for inspection by electrical maintenance men. The meter housing is of course located at a point in the pipe line where a measure of the gas flow is desirable. Refinements have been made in the design of the instrument panel to make it practically fool proof and shock proof. The new design follows the dead front principle of switchboard construction. The mechanism and connections are placed in an aluminum case and are arranged so that the sensitive parts are well protected but accessible. It is constructed jointly by the Leeds & Northrup Co., Philadelphia, and the Cutler-Hammer Co.



This Thomas Panel Differs from the Previous Design in That the Instruments Are Now Mounted Separate from the Regulator. This permits of each being located in the departments most interested

Industrial Commission of the Manufacturers' Council of New Jersey Organized

In accordance with the resolution adopted at the readjustment convention of the Manufacturers' Council of New Jersey at Newark, Dec. 11, an industrial commission has been organized from the membership of the council, and held its first meeting at the Robert Treat Hotel, Newark, Wednesday evening, Jan. 22. This commission, the first body of its kind to be formed for state industrial interests, is divided into five groups, representing manufacture finance, labor, agriculture and public utilities, respectively, each group to be composed of five members. The committee representing the manufacturers comprises Warren C. King, president King Chemical Co., and president of the council; Col. Austen Colgate, Colgate & Co., Jersey City; Kirk Brown, president Condensite Co. of America, Bloomfield; Charles Edison, president Thomas A. Edison Co., West Orange, and Peter Smith of the Barbour Flax Spinning Co., Paterson.

The Matlack Coal & Iron Corporation, through the New York office, at 52 Vanderbilt Avenue, and the Philadelphia office, in the Pennsylvania Building, reports an extensive business in shipments of coal and smelter coke, and also in pig iron and iron and steel products to South American ports. This corporation is represented by resident agents in Montevideo, Rio de Janeiro, Buenos Aires, and also in Genoa and Madrid.

LOWER PRICES PREDICTED

Vast Economies Will Probably Result from Governmental Investigations

BY ALEXANDER E. OUTERBRIDGE, JR.

The imperative need of conservation of all kinds of raw and manufactured materials since the outbreak of the European war has served to call attention to many methods of manufacture that have survived the period of their original purpose, and some unexpected and surprising revelations have been made recently in reports of investigations of the "Conservation Division of the War Industries Board," resulting in vast changes in some lines of manufacture; in fact, in nearly all lines.

Having been connected in a technical capacity with large manufacturing industries for nearly 40 years, I have had opportunity of observing great changes during that long time in methods of manufacture, particularly in iron and steel.

I remember being told by the superintendent of the Baldwin Locomotive Works about 30 years ago that a "traveling crane," then recently installed, immediately supplanted 60 husky men. Since that time many large traveling cranes have been installed in these works that will pick up a giant "Mogul" locomotive with the greatest ease and transport it quickly through the air over the heads of the workmen as though it were a mere toy. Coincidentally with the extended introduction of these great labor-saving appliances, the number of men employed has been far more than quadrupled.

This may seem contradictory, but universal erperience has shown that every successful labor-saving machine introduced into manufacturing industries results, often in a short time, in large increase in the number of employees.

As a striking illustration, it may be recalled that when the sewing machine was first brought into general use, many years ago, a great cry was raised against it on the presumption that it would cause starvation of poor sewing women, but the increase in facilities caused such great increase in manufacture of elaborately sewed garments that very soon many more women were employed in running sewing machines than were formerly engaged in hand sewing with the needle. Not only so, but statistics showed that very many more persons, male and female, found daily employment in the making of the sewing machines than were formerly employed in sewing.

I remember an incident of minor importance that came under my observation nearly 30 years ago. A man walking through a large manufacturing establishment noticed a pile of iron castings lying on the floor and men were engaged in drilling large numbers of holes about an inch in diameter in these castings, into which wooden plugs were then driven. Although not a mechanic he was surprised, and asked, "Why not make the castings with the holes in them, thus saving all this labor of drilling?" The superintendent smiled and said, "That's a good idea; nobody thought of it." From that day to this the castings have been made with the holes in them.

Prior to the publication of the reports of the investigations of the Conservation Division of the War Industries Board, few persons—even those familiar with manufacturing methods—had any conception of the waste of time, labor, material and money in unconsidered trifles, or in unnecessary and useless multiplication of patterns or designs, and long after this board shall have passed out of existence the fruit of its labors will continue to ripen.

Up to the present time the consumer has failed to gather any of these fruits, for war prices still prevail, but I am not without hope and belief that, in course of time, the vast economies that have come from these governmental investigations will cause material reductions in prices of all manufactured goods.

The Carnahan Sheet & Tin Plate Co., Canton, Ohio, has resumed operations after a shutdown for repairs.

Government Will Treat Industry Fairly

Supplies Will Be Disposed of in Such a Way as to Cause as Little Disturbance as Possible—Agreement Reached with Machine Tool Manufacturers

WASHINGTON, Jan. 21.—Industry is to be treated fairly in the vital question of the disposition of the Government's surplus stocks. That is the announcement of C. W. Hare, the new Director of Sales in the War Department, who has undertaken to dispose of the hundreds of million dollars' worth of supplies which the end of the war left in the hands of the Government.

Wherever possible, the actual disposition of the material is to be left in the hands of the manufacturers who sold it to the Government, and the policy to govern the disposition will be worked out at a conference of the Government authorities with the representatives themselves.

To carry out this program, Director Hare has already canceled all previous orders for the disposition of such material, and has issued a new blanket bulletin to all bureaus governing future sales. Under this ruling, a bureau that has on hand less than $100,000 worth of any one commodity may sell that stock through its own office; provided the sale is made with proper reference to market conditions and open competition. If the sale is a private sale, without advertising, three responsible bids at least must have been secured to guarantee that the interests of the Government are properly protected.

Where the totals exceed $100,000, however, the disposition must be made under the express approval of Director Hare. It is in these sales that the co-operation of the industries themselves is to figure most definitely.

Machine Tool Disposition

Already the department has held a special conference with the machine-tool industry and the building trades, and has reached an agreement with both that seems satisfactory to all concerned. Other industries are to be called in from time to time to talk over the specific difficulties of their lines. In the meantime, the War Department is trying to expedite the taking of the departmental inventory of surplus stocks, although it has proved a slow and tedious task. Because some of the bureaus reported that it might take months to make up a complete inventory of their materials, Director Hare ordered a preliminary inventory completed at once. This ought to be ready within a week, and will furnish the basis for a definite procedure.

Many problems have come up in connection with this question. The machine tool builders, for instance, wanted assurance that the machines they sold the Government would not be dumped upon the market in competition with their own products. This was settled by agreeing to leave the disposition to the manufacturers themselves. At first, the industry representatives seemed to favor a proposal of having the manufacturers sell the Government surplus on a share basis running over a period of years. This, however, failed, for it would merely prolong the solution without helping, and neither the Government nor the industry would be satisfied. Instead, it was agreed that the sale should be made direct to the manufacturer on extended terms of payment, and then it would all be in the hands of the manufacturers. Another difficulty arose over the disposition of machines which had been installed by the Government in private plants. These are to be sold to those plants—on an agreed price—but not for resale. If owners of the plants have no use in their own industry for them, the tools are to be turned back to the original manufacturer.

The Scrap Problem

An unsolved difficulty is still represented by the scrap situation. So far, the department has decided on no policy which will make sure that scrap stays scrap. It is the department's policy, apparently, that no material sold as scrap shall be turned over to junk dealers, who are liable to cull out parts to be sold as second-hand material. It is probable that machinery that is sold as scrap will be broken up by the Government before delivery, although so far no such policy has been announced. The same question comes up in connection with an item like unpainted barbed wire. This would offer a particular temptation for an unscrupulous dealer, who would have no difficulty in selling this unpainted wire to farmers who might not know its uselessness for their purposes. Such a sale would greatly injure the barbed wire industry as well as swindle the farmers. It has been proposed, therefore, that the Government should make sure that all such wire goes back into the melting pot before it gets onto the market.

The Price Question

Many of the details of the Government's policy are still in the making. Take the question of prices, for instance. Every one knows that the Government paid high emergency prices for much of the material which it bought during the war and which it now has on hand. The same is true of the factories it built and the machinery it installed, and which it must now dispose of. In some instances it may turn out that the Government officials and the industries are far apart on the item of proper prices. The representatives of the War Department declare that they mean to be fair to the industries themselves, but they will also see to it that the Government is properly protected. There will be no unnecessary sacrifices of Government property. Plants that have been erected for private industries will be wrecked and sold as junk, rather than to sell them at an unfairly low price to a manufacturer who happens to be in the strategic position of having them on his land. It is contended that this would be the only way that would be fair to the Government and to the industrial establishments that compete with the manufacturer who may be trying to "hold up" the Government.

On prices in general there has been a proposition that the 1914 prices would serve as a fair basis for "normal" prices, but this is another question on which the actual solution will depend upon the individual case. The Government officials, however, believe that all these problems can be solved if both the industry and the Government approach them in the proper spirit. So far, say the Government representatives, the industries have met every issue fairly.

Estimates Revised

The problem itself has been doing a lot of shrinking. The first estimates of the surplus Government materials totaled high in the hundreds of millions of dollars. But when it came to actual inventories they

dwindled heavily. There had been a preliminary estimate, for instance, of $300,000,000 worth of machine tools which must be disposed of. Now this has slumped to less than $100,000,000. A navy item of $20,000,000 disappeared entirely. It turned out that the original figure included equipment of various kinds in addition to the machine tools, and the small amount of real machine tools included were needed in other branches of the Navy Department. A large share of the War Department surplus is being similarly absorbed by other divisions. In the end the big question as to machine tools will hinge on the question of the amount of special tools that are on hand and which cannot be converted to other uses. So far, it has been impossible to secure any kind of an estimate of the figure for this. Of lumber and building materials the final total was less than $15,000,000.

After the meeting with the representatives of the machine-tool industry Director Hare gave out the following statement of the result:

"Arrangements for the disposition of surplus machine tools were made at a meeting of representatives of the machine-tool industry of the country and officials of the War Department. It was brought out at this meeting that the immense and vague figures which have recently been printed as the value of the surplus Government-owned machine tools which would soon be put on the market were not warranted. It is hoped that the industries can absorb within a reasonable time all the surplus Government-owned standard machine-tool equipment without serious disarrangement.

Points of Agreement

"The following tentative agreement, which is satisfactory both to the representatives of the War Department and to the machine-tool industry, has been made:

"1. The inventory of all machine tools and equipment which is being made will be expedited to the greatest possible extent.

"2. As soon as it is known that a quantity of machine tools is available for disposal the manufacturers of these tools will be given an opportunity to purchase them at a price and on terms of settlement which will be satisfactory to all parties concerned.

"3. In case it is impossible for the manufacturer to purchase his product outright an effort will be made to arrange for the marketing of the product by the manufacturer in an equitable manner, securing for the Government and the manufacturer alike the best possible terms.

"4. In case both these methods of disposition fail the material will be offered for sale to the general public in a manner prescribed by law.

"In the settlement of plant contracts, which involve the sale of large groups of various kinds of tools and equipment, an effort will be made to prevent the sale for resale of any equipment, as it is realized that considerable injury might be done by indiscriminate sales of this character."

Present at the meeting were: C. W. Hare, Director of Sales, Lt. Col. A. LaMar and George E. Merryweather of the office of the Director of Sales; A. E. Newton, Reed-Prentice Co., Worcester, Massachusetts, president National Machine Tool Builders' Association; W. A. Viall, Brown & Sharpe Mfg. Co., Providence, R. I.; C. Wood Walter, Cincinnati Milling Machine Co., representing the National Machine Tool Builders' Association; M. A. Sherritt, Sherritt & Storer, and H. W. Strong, Strong, Carlisle & Hammond, representing the National Supply and Machine Dealers' Association."

The "War Service Executive Committee of American Industries" has announced that it is at work on plans for close co-operation with the Government in the sale of surplus Government supplies. This committee was named by the advisory council comprising the chairmen of the 400 war service committees that co-operated with the War Industries Board during the war. The new executive committee is made up of the following:

Joseph H. Defrees, Chicago, chairman; E. A. Filene, Boston; A. C. Bedford, New York; W. L. Clause, Pittsburgh; Lewis E. Pierson, New York; R. G. Rhett, Charleston, S. C.; Homer L. Ferguson, Newport News, Va.; Harry A. Black, Galveston, Tex.; William Butterworth, Moline, Ill.; L. S. Gillette, Minneapolis, Minn.; E. T. Meredith, Des Moines, Iowa; Harry A. Wheeler, Chicago; James R. MacColl, Pawtucket, R. I.; Charles H. McDowell, Chicago; August H. Vogel, Milwaukee, Wis.; E. W. Rice, Jr., New York; C. S. Brantingham, Rockford, Ill.; Charles V. Ashbury, Philadelphia; William Ritter, Columbus, Ohio; James Bell, Minneapolis, Minn.

Sale of Surplus Materials and of Scrap by the Ordnance Department

The Chief of Ordnance, Washington, has issued the following notice:

1. All surplus, unused or obsolete construction and manufacturing materials, semi-finished and completed parts, miscellaneous supplies, etc., left over at time of cancellation or termination of ordnance contracts, or surplus, at arsenals and supply depots, will be ordered sold or stored as conditions require, by the sub-committee on sale of material of the Salvage Board. The actual sale of this material will be handled by the Material Branch of the Stores and Scrap Section of the Ordnance Department, through the district stores and scrap managers, located in each district ordnance office.

2. Capt. Ralph C. Shaw, chief, Material Branch, located in Group B, Section 1, Room 303, of the ordnance building at Seventh and B Streets, Washington, is compiling lists of the materials to be disposed of as promptly as these materials are reported for sale. Likewise, he is compiling lists of buyers of given classifications of materials. This information is being imparted to the district managers. Any Government agencies, or others interested in the purchase of any materials having been or to be ordered sold by the Salvage Board should communicate with the Material Branch.

3. All scrap left over from the operation of Ordnance Contracts will be sold by the Scrap Branch of the Stores and Scrap Section, operating through the stores and scrap managers of the district ordnance offices. This scrap consists of different kinds of steel in sheets, billets and turnings, scrap steel parts, cupro-nickel scrap, antimonial lead dross, silk and cotton waste, burlap, spent acids, etc.

4. District representatives of the Stores and Scrap Section can give information as to scrap available. Likewise, Lieut. Schleck, Chief, Scrap Branch, Group B, Section 1, Room 305, will be glad to advise as to amount of scrap on hand at any point, price at which it is being held, etc. Likewise, he will be glad to receive names of Government agencies or other possible buyers of these materials.

Government Motor Trucks on Hand

According to recent estimates of the trade, the U. S. Government will have 120,000 motor trucks when those now under contract and not canceled are built. Of this number it is stated that 20,000 are overseas. About 50 per cent of the trucks that were under contract for the Government when the armistice was declared were canceled. It is believed that it will take until well along in the summer before manufacturers complete the Government's outstanding orders for trucks. According to estimates, there are approximately 300,000 trucks in the United States used for commercial purposes, exclusive of the lighter trucks of one-ton capacity and under. Sales of the heavier trucks during 1918, exclusive of Government orders, are placed at 70,000 as compared with a probable normal demand of 50,000. The excessive demand during the year was due to war-time conditions and the heavy demand for trucks to supplement the inadequate railroad transportation facilities. The question that is now uppermost in the minds of manufacturers of trucks is as to what policy the Government will adopt in disposing of its surplus trucks. However, it is apparently the attitude of the Government not to dump these trucks on the market but to dispose of them in such a way as to disturb the normal trade as little as possible.

Getting the Workmen to Remember to Work

The Waterbury Plan of Dealing with Labor—Mobilizing the Industrial Army of Defense—Application of the Principles to Post-War Conditions

BY RALPH W. BUDD*

IF the men and women of to-day will only stop and compare this proclamation and this poster as issued by the respective governments when each was fighting for its very existence, they can be doubly happy that the doughboys and fighting men of this country, assisting those tried and true warriors of England, France, Belgium and Italy, have at last brought the exponents of kultur to their knees and the murderers of women and children to justice and the punishment which is theirs.

Now we come to that period of readjustment and reconstruction, a period when employers must readjust their plants from war work to the turning out of commercial lines, and when the worker must readjust himself or herself to return to the former occupation and arrange his or her personal affairs back into the line of their previous activities. A period of reconstruction when the business interests take up their old lines, once again send out salesmen in search of commercial orders and have to meet conditions on a competitive basis for the existence of their plants and the employment of their labor.

The Question of Turnover

But you must realize that the raising and proper placing of the 3,000,000 workers of this army was but a small part of the work that had to be done. The question of "turnover" was large and must be figured with. First, we must ask, what is the turnover of labor? To sum up briefly, turnover can best be described as the change in personnel brought about by hiring and termination of employment. Numerous conditions enter into the changes, many of which are beyond control or influence of the employer; then again there are conditions which are largely within the control of the employer, and because of their great importance they demand the most serious consideration.

Matters relating to problems of personnel are no less vital than problems relating to markets, machinery and materials. Conditions affecting turnover lie at the very base of all employment problems. Intelligent consideration cannot be given those conditions without knowledge of facts and such knowledge depends upon accurate data.

As to what was the proper method to educate the workers as to the seriousness of not sticking to their job was a matter of continual study to labor officials and heads of every war plant in the United States, but no universal method was adopted and each community was left to solve its own problem. After a careful study of all plans used by different plants and communities, a plan originated by the Waterbury, Conn., office of the Employment Service seemed to be most practical, and was recommended for its adoption by the officials of the service at Washington. Practically every city in the State of Connecticut had this plan at work in the numerous offices of the service, and it was recommended for its adoption in several other cities in the United States by the War Labor Policies Board. The success of this plan, which has become widely known as the "Waterbury Plan," can be summed up in the words "Getting the Workman to Remember to Work" and its practical operation is controlled entirely by the use of a release or through card, whereby every factory in the district under the jurisdiction of the Employment Service Office, which is the Central Clearing House, refuses to hire any applicant at its gate without his or her having in possession a release card of his last employer showing that the worker had played fair when leaving.

But regardless of this restriction the workers continued to be dissatisfied in a good many localities, and thousands of hours of productive labor were lost by this senseless shifting from job to job. The card system worked and accomplished its purpose as far as it could, but a study had to be made of the reasons of exits, and educational methods had to be devised to show the worker the foolishness of his ways, and the employer the loss to production and cost of re-employments; so to this end a daily report of exits from 69 different industrial plants engaged exclusively in the manufacture of war material and employing approximately 70,000 workers in a New England city were taken and analyzed as to reasons for leaving.

The major reasons, as found in most cases, can be classified under four headings, namely: 1, low wages; 2, heavy work; 3, housing conditions; 4, liquor.

Now to the finer analysis of the conditions, that were taken up to the most minute detail, with the results that in one city from July 24 to Nov. 1, 3269 cases were reported of employees who had left the plants and were returned, because they did not understand. In most cases, where the reason for leaving was given as too small pay, it was found that the workers had no other jobs to go to, but had heard that some shipyard or Government plant in some other district, which was advertising in daily papers for labor, was paying ridiculous figures for its class of work. It was then necessary to show this worker the true figures the plants in question were paying, and in most cases he felt satisfied he had been misinformed and returned to his job a more satisfied and better worker.

Too Heavy Work

The second reason of too heavy work was caused by the immense shortage of labor which existed. So many light jobs were open for the worker that you could not get him to do the heavy work while the plants were calling for men to do the light work, to which he could go at practically the same wages; or the difference was of no interest to him, considering the difference in the work.

The third reason, housing conditions, arose in every city where war work was done in any quantity, and was met in a good many cases by private corporations, municipal interest, and finally by the Bureau of Industrial Housing and Transportation of the Department of Labor through its subsidiary, the U. S. Housing Corporation, which was established in numerous cities to build homes for war workers. These homes could not be built in time for the immediate relief of the employees in different plants, and this immediate relief was met by the establishment of the U. S. Homes Registration Service, a subsidiary of the Bureau of Housing and Transportation, whose duty it was to register and secure every available house, apartment, room or living quarters of any kind and put this list at the disposal of the workers in war plants, so that, through the work of the U. S. Housing Corporation and the U. S. Homes Registration Service, thousands of workers were given better homes, and the reason of turnover from this cause greatly reduced.

Hardest to Fight

The oldest reason of turnover was liquor, and it was the hardest to fight, owing to the fact that the increased wages of a good many workers gave them the same money in three days as they formerly made in a week, thus causing them to work three or four days a week and loaf the rest, only to squander the excess in their two or three days of idleness, and to return to work at the end of that time in an intoxicated and stupefied condition resulting in their discharge by the plant.

*Superintendent, Waterbury District, U. S. Employment Service.

Connecticut manufacturers who have made a very careful study of the turnover situation are now practically to a concern backing the workings of the U. S. Employment Service, which has done so much for them in this careful analysis of their labor situation and has resulted in a condition of industrial peace, which peace has in turn resulted in a stability and continuity which has allowed many favorable conditions, such as:

A. Manufacturers have felt warranted in spending a large part of their earnings in the development of their plants and equipment.

B. During the period of the war, manufacturers have spent a great deal of time and money in the comfort and welfare of employees, and have maintained a relatively high wage scale. Today Connecticut has no "pauper" class and the "poor houses" are mostly "work houses."

It is hoped that the lessons learned in the war plants during the war will be used to good advantage, and that through the proper welfare work in each plant the worker will realize that a "rolling stone gathers no moss" and that the employer will take note that a satisfied list of employees is one of the best assets in the running of his industry.

Handbook on Employment Management

A "Handbook on Employment Management in the Shipyard" has been published in pamphlet form by the employment management branch, industrial relations division of the United States Shipping Board Emergency Fleet Corporation, Philadelphia. The subject matter deals with modern methods and practices of employment management. Many of its ideas would be applicable to any industry though they are designed to fit the peculiar conditions of labor in America's greatly expanded industry.

The main factors emphasized in the booklet as being necessary for a model employment system are: the providing of spaciousness of waiting rooms, privacy of the personal affairs of one applicant among his fellows, a private exit from the building for the man or woman rejected, a keeping separate from the newcomers of the individuals who come to make complaints, and the posting of boosting propaganda for the plant and its work in the waiting rooms where would-be employees may read. According to the pamphlet, "a well appearing and well equipped employment department acts as a magnet to the working public."

The author states: "The layout of a modern employment department building should provide for the following: applicants' waiting room, preliminary interview section, final interview section, application recording section, physical examination section, photographic section, pass clerk's section, service section, section for general clerical force, adjustment section, employment manager's office."

The architectural plans for three model employment bureaus, each one designed for a different sized plant appear in the back. A copy of the pamphlet can be secured from the United States Shipping Board Emergency Fleet Corporation, Philadelphia.

Emanuel Dreifus & Co., who have conducted a business in iron and steel scrap in the Commercial Trust Building, Philadelphia, will move their offices to Douglassville, Pa., where the business will be liquidated between now and April 30. Emanuel Dreifus, president of the company, will retire from business, and Stanton L. Dreifus, secretary and treasurer, has established offices in the Pennsylvania Building, Philadelphia, and will conduct a brokerage business in scrap under his own name. Henry P. Rees, vice-president, is taking over the business of the Pottstown Steel Co., and will operate a scrap yard as well as a general brokerage business at Douglassville, Pa.

The Tennessee Coal, Iron & Railroad Co. has about completed its No. 9 open hearth furnace at Ensley, which has been a year building. It is the largest of the battery and has a capacity of 120 tons. The expectation is that the entire new Fairfield works and the Mobile shipyard will be in operation by early spring.

TO REVISE SHIP PLANS

President Farrell Is Appointed Chairman of the Special Committee

WASHINGTON, Jan. 21.—J. A. Farrell, president of the United States Steel Corporation, has been appointed to head the special committee which will revise the building plans of the United States Shipping Board's Emergency Fleet Corporation.

The other members of the committee are P. A. S. Franklin, president, International Mercantile Marine Co.; George S. Dearborn, president, American-Hawaiian Steamship Co.; H. H. Raymond, president and general manager, Mallory Steamship Co.; F. D. M. Strachan, president, Strachan Shipping Corporation. In addition to these, Charles Piez, director general of the Emergency Fleet Corporation, and John H. Rosseter, director of operations of the United States Shipping Board, will be ex-officio members of the committee. Of these Mr. Dearborn and Mr. Raymond are the nominees of the American Steamship Association, which was asked to designate two of its members for places on the committee.

"Until hostilities ceased the purpose and effort of the Fleet Corporation was to produce useful tonnage in the largest possible quantity to keep pace with the growing need of tonnage as our overseas forces increased, and to repair the destruction wrought by submarines," says the official announcement of the committee's appointment. "With the signing of the armistice, the problem of the Fleet Corporation took on a different aspect, and the question now is, what revisions of type are advisable and what modifications of plan or practice can be undertaken to give the Fleet Corporation's output of ships as high an economic value in world trade as possible.

"The lifting of the pressure, both of need and time, which controlled the Fleet Corporation's decisions during the actual continuance of war, makes it possible to give more consideration to economic standards, and the Director General and the other officials of the Fleet Corporation have for many weeks been engaged in a thorough examination of the corporation's building plans and have themselves developed some important suggestions. It is to test these proposed alterations of program that the committee above named has been appointed. All are men who are identified with large and successful shipping enterprises, and they will bring to the consideration of the Fleet Corporation's work a knowledge that has been tested by wide experience."

Bainbridge Colby, who has been acting as chairman of the Shipping Board in the absence of Edward N. Hurley, has tendered his resignation as a member of the board. It is not expected, however, that the Commissioner's resignation will be accepted by President Wilson until after the latter's return from Europe. Mr. Colby explained that he had tendered his resignation in December, with the request that it be given consideration as soon as the work of the board permitted.

Welfare Work in Alabama

The American Cast Iron Pipe Co., Birmingham, Ala., has issued a 72-page booklet called "Acipco," a word fabricated from the first letters of the company's corporate name. It is "a story of modern industrial relations." With printed word and photograph it describes fully the material, social and moral devices recently incorporated in the plant to make satisfied and efficient workmen. The employee's comfort, recreation and education are provided for thoroughly from "the cradle to the grave," so to speak—from the well equipped playgrounds for the children to the liberal pensions for the aged. The company believes that its welfare work has done much to settle the race question, "the white men feeling a certain responsibility for the conduct of the colored men, and the colored workmen maintaining a respectful attitude toward the place and its surroundings."

Action of Slags on Refractory Materials

Influence of Temperature on Three Grades of Firebrick—Six Different Slags Used—Relation of Output to Life of Lining

THE important question of the action of certain slags on refractory furnace linings, especially when production is at the peak, was discussed by Raymond M. Howe, industrial fellow, Mellon Institute, Pittsburgh, before a meeting of the Refractories Manufacturers' Association in Pittsburgh last November. The substance of the paper follows:

During any period of intense industrial activity, the linings of the various furnaces have played a very important role in determining their capacities. In some cases the firebrick or special shapes have given long continuous service, while in other cases the results have not been as satisfactory. As a result, there has been some contention between the consumers and manufacturers of firebrick as to the relative merits of this product, the consumers often claiming that it is not of the pre-war standard and the manufacturers maintaining that it is of equal quality. The latter maintain that the shorter life of refractories, when encountered, is often due to the more severe duty which is imposed upon their product during the struggle for an ever-increasing output of metals.

The work here presented was carried out for the purpose of determining the action of various slags at different temperatures on several standard brands of firebrick. The data secured would therefore appear to bear directly upon the question at issue, for it is well known that a common means of increasing production consists of increasing the working temperature.

Test Used by Carnegie Steel Co.

The general plan was to secure bricks of recognized quality and to test the action of several slags upon them at different temperatures. The method used for determining this action was essentially the same as is used at the Carnegie Steel Co. Work done at that laboratory has shown that if a brick is heated to a definite temperature and 35 grams of slag are placed in a cavity at that temperature and are allowed to act for two hours, valuable information can be secured.

Before adopting this company's method certain points were checked pertaining chiefly to the influence of the time of action of and the quantity of slag used upon the results secured. Tests were made in which the time and slag were trebled, but this procedure failed to produce a more pronounced action.

In reporting the results the total cross-section of the slag-saturated area was first measured by means of a planimeter. The area of the original cavity was then subtracted from this. The difference represented the area of the section which had been penetrated by the slag. This area when divided by the linear surface contact gave a value which represented the square inches of penetration per inch of contact.

Table 1—Influence of Time and Quantity of Slag Used Upon Results Secured from Slag Tests

Penetration of 35 grams of slag in two hours	0.64
Penetration of 35 grams of slag in four hours	0.68
Penetration of 35 grams of slag in six hours	0.64
Penetration of 105 grams of slag in two hours	0.76
Penetration of 105 grams of slag in four hours	0.72

The results given in Table 1 confirmed those reported by Nesbitt and Bell and lead to the same conclusions, that when a brick having a cavity 2½ in. in diameter is treated with 35 grams of slag and it is allowed to react for two hours, satisfactory results are obtained. In the preceding work 35 grams of slag reacting for two hours resulted in a penetration value of 0.64. When the severity of this test was increased 600 per cent, the penetration factor increased but 12.5 per cent.

Method of Procedure

In view of this preliminary work, the following definite method of procedure was adopted: The test bricks, each having two cavities 2½ in. in diameter by ½ in. in depth, were heated slowly to the temperature at which the test was to be made. This temperature was held for 1½ hr. Thirty-five grams of slag were then introduced and were allowed to react at this temperature for 2 hr. The bricks were then allowed to cool, were cut through the center of the cavities, and the penetration was noted in the manner previously described.

Six slags, which were secured from the Carnegie Steel Co.'s laboratory, were used during the test. Their analysis and fusion points are given in Table 2. The three bricks used are designated by A, B and C.

Table 2—Analysis of Slags Used

	Blast Furnace	Heating Furnace	Basic Open-Hearth	Acid Open-Hearth	Zinc	Copper
Silica	37.32	34.16	18.42	46.48	34.30	28.20
Alumina	13.21	6.13	3.85	5.45	14.74	2.20
Iron	1.62	43.60	14.55	29.30	21.00	2.10
Lime	42.20	1.30	44.10	2.16	2.33	2.51
Magnesia	2.35	0.65	6.32	....	7.07	2.14
Manganese	1.11	0.55	5.09	9.08	6.77	....
Sulphur	1.20	0.27	0.42	0.38	5.88	0.14
Phosphorus	....	0.02	0.58	....	6.02	0.24
Copper	....	....	....	....	1.28	58.21
Zinc	....	....	....	....	8.20	....
Melting point, deg. C.	1220	1050	1275	1400	1025	1020

Experimental Data

By following the method already described and varying the brick, the slag and the temperature, one at a time, the average results were secured as shown by the various tables.

Table 3—Effect of Various Temperatures Upon the Penetrating Power of Heating Furnace Slag (m. p. 1050 deg. C.)

Brick	Temperature of Test: 1150 deg. C.	1250 deg. C.	1350 deg. C.	1450 deg. C.
Type A	0.04	0.09	0.15	0.34
Type B	0.02	0.05	0.11	0.79
Type C	0.07	0.10	0.24	0.78

Table 4—Effect of Various Temperatures Upon the Penetrating Power of Blast-Furnace Slag (m. p. 1220 deg. C.)

Brick	Temperature of Test: 1250 deg. C.	1350 deg. C.	1450 deg. C.
Type A	0.03	0.08	0.14
Type B	....	0.11	0.17
Type C	0.07	0.12	0.17

Table 5—Effect of Various Temperatures Upon the Penetrating Power of Zinc Slag (m. p. 1025 deg. C.)

Brick	Temperature of Test: 1150 deg. C.	1250 deg. C.	1350 deg. C.	1450 deg. C.
Type A	0.03	0.13	0.28	0.19
Type B	0.04	0.16	0.29	0.32
Type C	0.05	0.24	0.33	0.43

Table 6—Effect of Various Temperatures Upon the Penetrating Power of Basic Open-Hearth Slag (m. p. 1275 deg. C.)

Brick	Temperature of Test: 1350 deg. C.	1450 deg. C.
Type A	0.58	0.73
Type B	0.29	0.33
Type C	0.44	0.55

Table 7—Penetration of Acid Open-Hearth Slag (m. p. 1400 deg. C.) at 1450 deg. C.

Brick	Penetration
Type A	0.24
Type B	0.33
Type C	0.57

Table 8—Penetration of Copper Slag (m. p. 1020 deg. C.) at Two Temperatures

Brick	Temperature of Test: 1150 deg. C.	1250 deg. C.
Type A	0.46	0.65
Type B	0.36	0.57
Type C	0.52	0.62

In each case the slag penetrated more deeply into the brick at higher temperatures. In several cases an

increase of 100 deg. C., or less than 10 per cent, resulted in nearly doubling the penetration.

This increased penetration has several effects in actual practice. One effect concerns the strength of the brick itself. It is a known fact that bricks when saturated with slag are not so strong at high temperatures as when they are free from slag. This decreases their ability to sustain the weight of the other parts of the furnace.

The refractoriness of the lining is also decreased when it becomes soaked with slag.

The lining is also subjected to more severe chemical action. This action takes place rather slowly in many cases but rapidly in others. In any event, the action takes place sooner when the slag forces its way further into the inner portions of the lining. Being more active at higher temperatures, its solvent power is also increased.

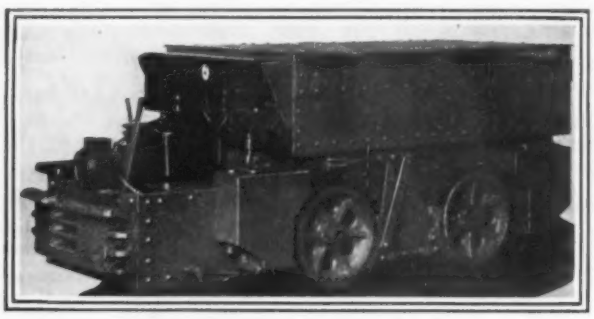
Relation of Output and Life of Lining

In view of these tests, it appears very much as if the relation of output and the life of the lining is similar to the rate of driving and the life of an automobile. Cars which operate successfully for 50,000 miles when driven at the rate of 20 miles per hr. give much less service when driven 40 miles per hr. These same cars when subjected to the grueling ordeal of a stock-car race often fail to complete the first 100 miles.

Such conditions are constantly encountered when any product is driven to its limit. Such being the case, it is not fair to compare the lives of furnace linings on the daily basis. Neither is it fair to compare them on the tonnage basis, when one furnace is worked at moderate and another at maximum capacity. Under conditions occurring with increased output, they must be compared according to a sliding scale. If a furnace is operated under such conditions that the daily output of metal is increased 50 per cent, it cannot be expected to last as long, or even two-thirds as long (during which time equal tonnage would have been secured), but from one-third to one-half as long. The consumer must realize this and balance his costs under normal production against those under increased production. If the balance is in favor of conditions of increased production, he must, if he uses the most suitable material, expect continued shorter service from linings.

Battery Locomotive for Coal Mines

A new type of storage battery locomotive designed for use in coal mines and having a number of new features has been built for the Pittsburgh Coal Co. by the Atlas Car & Mfg. Co., Cleveland, and has been



A 5-Ton Mine Locomotive Designed for Efficiency and Ready Accessibility of Parts

added to the line of standard products of the latter company. This locomotive is of 5-ton capacity and is driven by two 80-volt motors of the vehicle type. The transmission bearings are ball bearing, so mounted that they are said to prove very satisfactory and efficient. The battery box is removable, giving ready accessibility.

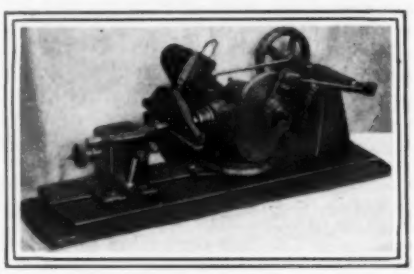
The motors can be removed without disturbing the other parts. The brake is of special design and powerful. It is operated by a lever with a single motion and has a positive release. The locomotive is equipped with sand boxes adjoining each wheel for sanding the rails. The principal dimensions are, length overall 10 ft. 7 in., height 3 ft. 9½ in., width 4 ft. 3¼ in. diameter of wheels 20 in.

Owing to the fact that numerous students received their discharge from Government service too late to take advantage of the regular session, the Graduate School of Business Administration at Harvard University will conduct a special session from Jan. 27 to Aug. 30, 1919, inclusive. The session will be divided into two halves, the first to extend from Jan. 27 to May 10, inclusive, and the second from May 12 to Aug. 30 inclusive. There will be no recess during the special session. Additional information will be furnished on request by the Graduate School of Business Administration, 17 University Hall, Cambridge, Mass.

A new timekeeping system, which has reduced disputes at the pay window 99 per cent, has been installed by the Pacific Coast Shipbuilding Co. on Suisun Bay, 35 miles east of San Francisco. Each of the 2500 employees is given a daily receipt for time worked, the company keeping the punched duplicate.

Attachment for Marking Dials

An attachment to go with the firm's 10-in. index center has been developed by the Schipper Machine & Tool Co., Aurora, Ind. The object of the attachment is to graduate or mark dials at any angle from 45 to 90 deg., and around the entire circle of dials of machine parts to be graduated or calibrated. It will swing parts up to 10 in. diameter, giving four short marks and one long one. The combination can be mounted on any flat surface, such as milling machine table, planer bed or on the bench. The center will swing 10½ in., and can be swiveled on the base as well as in the housing. The machine weighs 110 lb. Advantages claimed are speed of operation and low cost.

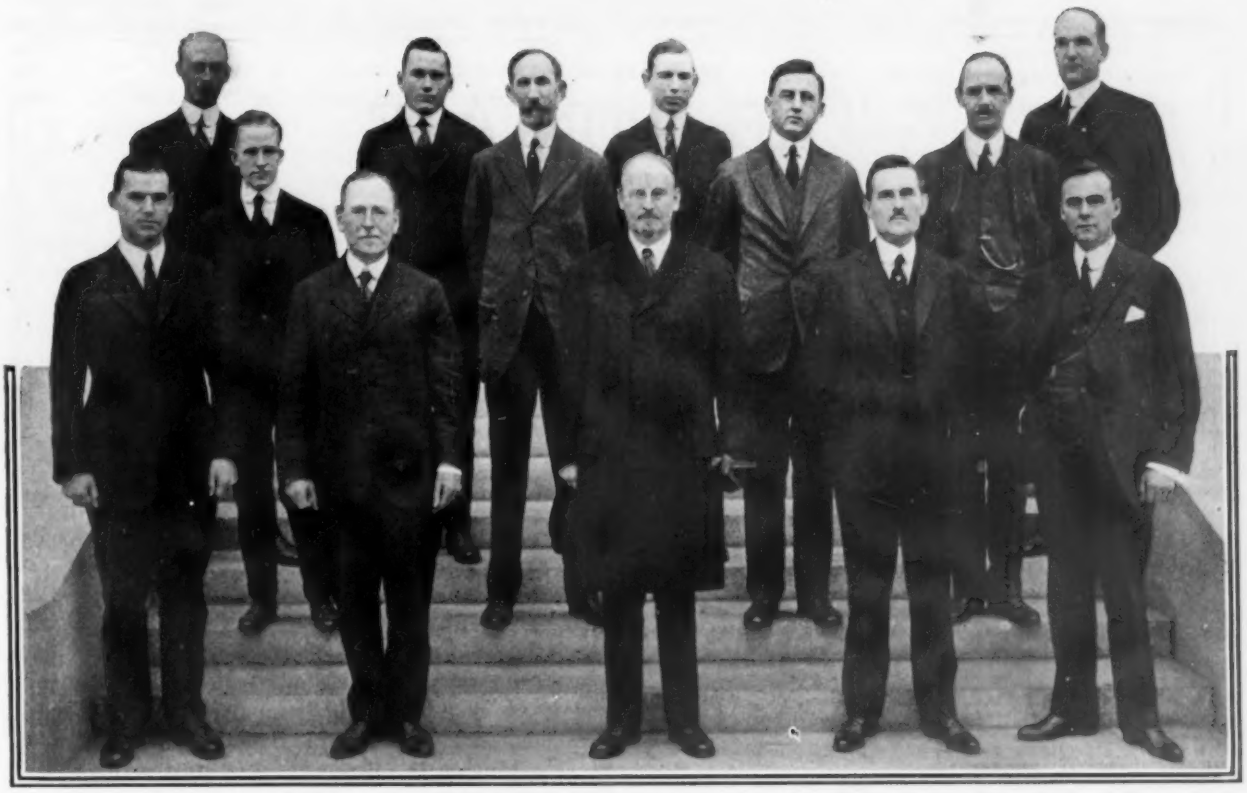


Index Center Attachment for Graduating or Calibrating Dials

Offers Assistance on Employment Problems

A. B. Segur, industrial engineer, in charge of the Chicago office of the Red Cross Institute for the Blind, states that the institute is working on the basis that when employers begin more generally to study their employment problems the Red Cross will be relieved of this phase of its work, and that any manufacturer wishing to have a survey made of the requirements of his plant from the employment viewpoint may have the co-operation of the institute, including industrial engineering assistance. It is expected of the employer that he will give the blind a chance, although the advantages to be obtained will be broad enough to be of general application. Mr. Segur believes that labor turnover can be materially reduced through the determination of a full set of requirements for every job. His office is in the Conway Building.

A description of toluol plant construction and operation, a discussion of the various results which can be obtained, and a brief outline of the cost of carrying out this recovery are contained in technologic paper No. 117, entitled "Toluol Recovery," issued by the Bureau of Standards, Washington, D. C. The relation of toluol recovery to standards for gas service is covered. Typical forms of contracts which the ordnance department has used in contracting for the construction and operation of Government owned toluol recovery plants in connection with city gas works are also given.



These Are the Men Who Conducted the War Minerals Investigation for the Bureau of Mines Which Made It Possible for the United States to Produce Thousands of Tons of Rare Minerals Necessary for the Prosecution of the War. Reading from left to right the members of the staff with their occupations follow:

A. G. White, in charge of the sulphur resources; also administrative assistant to the executive of war minerals investigations; mine economist for the Bureau of Mines; Secretary of War Minerals Committee.

J. E. McGuire, in charge of the investigations of chrome and tungsten.

J. C. Orchard, assistant mine economist for Bureau of Mines, in charge of the editing and publication of a series of confidential reports on the political and commercial control of the mineral resources of the world.

W. C. Phalen, mineral technologist for the Bureau of Mines, field work on manganese for the war minerals investigations.

G. J. Salmon, in charge of labor problems connected with the metal and non-metalliferous mining industry, member of committee on mechanical labor saving devices as applied to mining; also in charge of matters related to industrial furlough from the army in co-operation with the War Department.

A. W. Stockett, in charge of the war minerals investigations for potash resources; also a member of the committee of the Bureau of Mines appointed to advise the capital issues committee on mining and related applications.

J. E. Spurr, executive of the war minerals investigations of the Bureau of Mines, and formerly a member of the committee on mineral imports of the Shipping Board.

H. S. Mudd, in charge of the war minerals investigation of graphite, antimony, and bismuth; assistant secretary of the war minerals committee; member of the committee of the Bureau of Mines appointed to advise the capital issues committee on mining and related applications; representative of the Bureau of Mines on joint information board and general contact for the minerals and their derivatives.

A. E. Wells, in charge of sulphuric acid work for the Bureau of Mines in co-operation with the War Industries Board and the Chemical Alliance.

H. C. Morris, in charge of the war minerals investigations of various metals; also a member of the committee of the Bureau of Mines appointed to advise the capital issues committee on mining and related applications.

C. M. Weld, in charge of war minerals investigation of manganese, iron ore, ferrosilicon, and later of chrome; representative of Bureau of Mines on ferrous section of the War Industries Board; now assistant executive of the minerals investigation.

F. H. Probert, engaged in special field work for the war minerals investigations; dean of the mining department of the University of California; consulting engineer of the Bureau of Mines.

H. A. Buehler, in charge of the war minerals investigations of pyrite; also state geologist of Missouri.

The Girod Electric Steel Plant in France

The *Echo des Mines*, Paris, gives some particulars of the electric steel plant at Ugine, in the South of France, founded by Paul Girod, with an annual output capacity of 60,000 tons of steel produced entirely in electric furnaces. The Société des Aciéries Electriques Paul Girod was formed by him in 1909, and the Société Electrométallurgique Paul Girod for the production of ferroalloys six years previously. In July, 1917, the two companies amalgamated with a share capital of $3,000,000, increased recently to $4,500,000. The company operates an electric steel plant, an electric plant for producing ferroalloys, an electrode factory, and at Courtepin a carbide of calcium plant. The electric steel plant consists of eight furnaces, three of 20 tons, three of 12 tons, and one each of 6 tons and 3 tons respectively. For dealing further with the steel there is a rolling mill; several forges, including a shell-forge; a steel foundry, a complete plant for the heat-treatment of steel, etc. There is also a compressed air-power station. The ferroalloys made include ferrosilicon, ferrochrome, ferromolybdenum, ferrotungsten, ferrovanadium and ferrotitanium, and are produced in 21 electric furnaces. The waterpower employed represents 46,700 hp.; some of the power is sold to outside concerns.

Progress in Screw Thread Standardization

The National Screw Thread Commission will call a public meeting in New York early in February for the purpose of discussing with engineers and manufacturers their findings regarding screw thread standardization. Considerable information has been accumulated by means of public meetings and correspondence, covering various screw-thread practice, including screw bolts of various forms of threads, machine screws, hose couplings, brass tubing, pipe threads, basis of fit of screw and nut, classification and tolerance for various forms of fit.

The commission is composed, by an act of Congress, of representatives of the Army and Navy, Bureau of Standards, American Society of Mechanical Engineers, Society of Automotive Engineers, and has its headquarters at the Bureau of Standards, Washington. It was appointed Sept. 21, 1918, for a period of six months.

The Philadelphia section is to meet in the Engineers' Club in that city on Feb. 1. The subject to be presented is "Electrical Features of Hog Island" by John H. Anderton, chief electrical engineer and H. W. Osgood, electrical engineer of the American International Shipbuilding Corporation.

ESTABLISHED 1855

THE IRON AGE

EDITORS:

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Continued Striking Shortsighted

If labor continues to declare strikes a readjustment to lower wage scales will be brought about more rapidly than seemed possible a few weeks ago. Our factories are not under the pressure for deliveries which marked the industrial situation through the war period and they are strong financially. Should profits cease to be measurable with continued high costs, lower prices and diminishing demand, manufacturers still have surpluses which would tide over a trying period. Accordingly they are not forced by circumstances of expediency to stop a strike without regard to results. Instead they can meet a walkout with a lockout and re-employ at their own terms when labor again wishes to resume work.

What the labor union does not admit is a preponderating desire on the part of the employers that the employee shall receive as high a return for his service as possible. The depreciated value of the dollar is understood, but so also is the serious tendency, which it is hoped is temporary, to produce little rather than much in return for the wage payment. The employer as a class is suffering for the selfishness of his predecessors of a generation ago. As has been said often before, the wage payer in the height of his power, including influence in legislatures, secured more than his just measure of protection, and now labor in a position of power is abusing it with the result that he is alienating general public sentiment. The spirit of the times spells so much for the ascendency of justice that it is too bad that the two big parties in industrial operations cannot join their forces to check the swing of the pendulum to the extremes.

There has been no effort discernible on the part of the employers to push down the scale of wages in an arbitrary way. Should there be some months of relative dullness or slow speeding up of manufacturing operations it seems certain that the law of supply and demand so far as labor is concerned will bring about its own safe readjustment, and it is a dangerous thing for organized labor in the face of a doubting public sentiment, to strive to push up still further an important factor in the cost of living. If history repeats itself it is undoubtedly a fact that the unions are at the height of their power, for when there is insufficient work to engage every one fully the unions do not secure pecuniary advantage for their members and it becomes increasingly difficult to hold them in line.

If the conservative element in the labor circles could regain their control it is probable that the wage earners would be made to see that what is needed in this new era of world competition is more attention to output than to unit wages. The latter will take care of itself. Our foreign commerce has enough to combat without having the added handicaps of high wages and low output. The nations abroad are constantly pointing their finger at the admittedly high relative efficiency of our factories and are making every effort to cut down this difference. No one wants to see any labor strifes; no one wnats to see any greater reduction in incomes than absolutely necessary, and certainly no more sudden cuts than represented, for example, by the elimination of overtime; but if striking persists the power of the War Labor Board, with its already dulled teeth, can hardly be invoked and sharp readjustments must follow.

Analyzing Steel Demand

In ordinary times demand for steel has risen and fallen so uniformly in the various channels that call for it that little attention has been paid to the individual attitudes of the various classes of buyers. If some classes of buyers were active in the market other classes were likely to be active also, while if some buyers cut down their purchases others usually did so also.

Conditions now are different. There never were conditions like those now obtaining. Some points of similarity can be observed between present conditions and those of various times in the last, but in no case can anything like a complete parallel be discovered. For illustration, when a regular buying movement in steel, with its price advances, has run its course, there is a period of very light buying during which buyers expect prices to decline. Here is a similarity, but there is one great difference, that after one of the historic movements the country found itself well supplied with the things into which steel is put. Hotel and office buildings, for instance, had been erected freely, perhaps to an extent somewhat beyond the requirements of the times, but there has been relatively little new construction of

this sort in the period of steel activity recently ended. Instead of large quantities of steel having but put into permanent employment, large quantities have been destroyed or put into forms no longer useful.

By reason of the novel situation in which the steel trade finds itself, there is a disposition to study the sources of steel demand, to analyze the normal distribution, in order that the buying capacity or buying disposition of various classes of buyers may be considered. Ordinarily this is not done. If business is good, all classes of steel buyers come into the market.

Years ago the steel trade had a tradition that the railroads consumed 40 or 50 per cent of the total output. It is doubtful whether the proportion ever was so high, although it may have obtained in 1887, the year in which occurred the greatest addition on record to the railroad mileage of the country, over 12,000 miles. In 1906 and 1907 the railroad proportion was also very high, represented chiefly by rails, steel cars and locomotives. From 1908 to 1914 inclusive the railroad proportion of the total steel demand probably lay between 15 and 20 per cent. Even such a proportion would make the railroads an important customer of the steel industry, and thus it is an important fact that the way to railroad buying is largely blocked by the fact that the future of the railroads has not been decided and will not be decided for months. The Railroad Administration is not in position even to formulate, much less to begin carrying out, a comprehensive program of railroad rehabilitation and extension, and those who own the railroads and formerly managed them are likewise in no position to act. Thus irrespective of prices, of labor conditions and of business prospects railroad buying on an extensive scale cannot possibly occur.

The favorite division now made of steel buyers, outside the railroads, is into everyday or hand-to-mouth buyers and investment buyers. Various nomenclatures may be used. The everyday buyer may be regarded as one who consumes steel, the investment buyer as one who puts it into employment of distinctly permanent character. Or, the matter may be looked at from an entirely different angle. It requires a certain amount of steel to maintain the ordinary activities of the people, to supply the people with tin cans containing food, oil, paint and other articles, to furnish material for repairing their buildings, to provide tools and machinery from hatchets to typewriters, to replace wire fence that rusts away, and to perform various other quite common functions. On the other hand, over a period of years a large quantity of steel is used in expansions of the activities of the people, for the erection of new bridges and buildings and the equipment of new factories, for new power stations, for water power development, for land reclamation, and various other operations definitely involving expansion rather than a mere continuance of customary activities.

It will be observed that no matter what nomenclature is used, no matter what the angle from which the matter is viewed, a distinction at once makes itself clear. There are two classes of steel demand; one the everyday demand; the other the demand that is connected with expansion, development or "investment." Usually these two classes of demand run with an even front. When business is good, the two classes of buyers are equally in evidence. When it is poor, the investor practically withdraws while the everyday buyer slackens, for while he cannot postpone his buying indefinitely he can wait a shorter or longer period.

To-day the two classes of buyers, instead of occupying a common attitude, are diametrically opposed in their positions. Automobiles and typewriters are distinctly scarce, while in tools and various everyday activities there is a very fair turnover. On the other hand steel is not flowing into permanent construction jobs, or into investments, to any extent, and there is no promise of immediate revival in steel demand along that line. The present steel making capacity is 117 per cent greater than the average production in 1906 and 1907, when steel was flowing smoothly into all its regular channels of consumption and employment. Accordingly it appears that there must be a full demand all along the line to require operation of the entire steel making capacity now in existence.

Reconstruction Business

A readable and informing report on reconstruction of the devastated regions of France has been published in Consular Reports issued by the Bureau of Foreign and Domestic Commerce of the Department of Commerce. It is a contribution from Commercial Attaché Pierce C. Williams, Paris. It bears out contentions of the special editorial communication on the general subject printed in THE IRON AGE of Jan. 2 from a member of this journal's staff who himself made a study of the situation abroad. Mr. Williams, however, emphasizes one feature to which no special attention was called, and this is the fact that much old and partly disabled machinery in evacuated sections will perforce of circumstances be repaired and put into shape for manufacturing as early as possible. The fact is a recognition of the need of providing employment fully as much as it is of the desirability of getting on a manufacturing basis. Machinery which was rendered inoperative because the Germans rifled the plants of bearing metals and of leather belts might well be scrapped from the standpoint of efficiency, but having in mind the human factor, the displacement of old machinery will have to be delayed.

All of this is added argument that spells, as contended in our own review, for a demand which will be spread over a number of years rather than otherwise. Meanwhile the pressure of immediate needs will be supplied in no small measure by the increased industrial capacity of France south of the fighting zones. Here factories which were developed to produce munitions of war are undergoing readjustment for peace-time demands, and machinery requirements are thus reduced by that fact below the pre-war estimates. Raw material purchases are those which will mark the first buying by France from the United States.

Placing Soldiers Where They Fit

In restoring to industrial usefulness the great number of men discharged from military service, a problem certain to be encountered is a disposition on the part of many of the men to start out on new lines, or in new localities, instead of returning to their pre-war means of livelihood.

A certain consequence of adventure into new fields of employment is that many men will land in positions where they cannot render their best, where they do not fit and where they cannot last. A labor turnover greater and more costly than ever will likely result. Returning soldiers must be urged to repress new but vague ambitions and settle down to old pursuits for the time being. Every locality needs to care for its own. Oversight of this kind will simplify the work of volunteer, civic and governmental agencies which are trying to replace soldiers in useful employment and where they fit. Sentiment of itself will not last long in keeping men at work if it is not suitable. A great process of sifting and classification is in order, to which the views and intentions of many of the men are likely to be a detriment.

It must be considered that the soldiers return to civilian life with eyes and minds wider open than ever before but with minds still unschooled to weigh stern realities. Numbers have for the first time viewed large cities, with their lights and lures, legitimate and otherwise; they have seen great oceans; they have traveled, and the seeming obstacle of distance has been broken down; they have had a taste of new and strange experiences, and they view their old life, on the farm or in the shops, as narrow and uninteresting. For them to say they intend to seek new fields, or to "drift" from city to city for two or three years, is common. Of course, the glimmer of the tinsel will fade for many when they again come under home and parental influences.

Activity After Wars

In a letter to Judge Gary published elsewhere in this issue, E. A. Kebler makes public, without comment, some statistics collated with respect to pig iron price movements after the Civil war, Franco-Prussian war, the Spanish war and the Russian-Japanese war. In each of the four cases, prices advanced in very marked manner, and Mr. Kebler allows one to draw his own conclusions. The remarkable coincidence in the four cases prompts study and analysis. One general observation should be premised, that the United States has been subject to recurrent periods of industrial depression, frequently of several years' duration, and throughout those periods prices have fallen, because costs decreased. The lowest prices have always occurred upon the eve of a revival. In the 1893-8 depression, for instance, the lowest prices fell in the summers of 1897 and 1898, although each of those years showed larger profits than either 1896 or 1894.

The panic of 1857 was precipitated by the failure of the Ohio Life Insurance & Trust Co., Aug. 24, 1857. No. 1 anthracite foundry pig iron at Philadelphia was then $26.75. During the years of depression that followed, the decline was more or less continuous, the opening of the Civil war stimulating business, but the low point in pig iron was reached in October, 1861, $18.50. It is true that after the Civil war pig iron prices were very high, but there is an unfortunate feature in Mr. Kebler's citations, in that the pig iron price on a gold basis is taken for August, 1864, whereas the price for 1866 is given on a currency basis, and gold averaged 140 during 1866.

It is true that business in the United States was very active after the Civil war, but in some respects the activity was one which no one desires to see repeated. Public improvements that were not altogether needed, and for which the people were in no position to pay, were forced upon the South. The land grant railroads of Congress developed into a scandal.

As to the activity that followed the Franco-Prussian war and the influence the war itself exerted, nothing better can be done than quote verbatim James M. Swank's appraisal, published in his annual report to the American Iron and Steel Association late in 1873. Mr. Swank said:

> The year 1871 was one of general activity in the iron business of Great Britain and the United States. With the close of the Franco-Prussian war in the summer of that year, the European demand for iron, to repair the waste of the war, to compensate for decreased iron production during its continuance, and to facilitate railroad construction, very greatly increased. Another cause of the increased European demand for iron in 1871 was the extensive substitution by European nations of iron ships for those of wood, and the tendency in various other industries besides shipbuilding to put iron to new uses. The demand from all causes was fed by the abundant capital which had been let loose at the close of the war, and now sought investment. In the United States the fever for building railroads, added to some of the causes enumerated above as influencing the European market, produced an extraordinary demand for iron in 1871. We built over 7000 miles of railroad in that year, and we needed iron for ships, bridges, architectural work, and all the other purposes to which an inventive and prosperous people could adapt it.

Mr. Swank's reference above to "abundant capital" should be collated with the fact that the Franco-Prussian war was a very short one. As time passes, wars are shorter in proportion to their intensity, history telling of a hundred years' war and a thirty years' war. It should be noted, too, that the panic of 1873 and the industrial depression that followed were of unusual severity.

That the iron and steel boom of 1899 occurred the year after the Spanish-American war proves that pure coincidences can occur. The boom of 1899 was similar in all respects to that of 1879. Each followed an industrial depression of practically the same length.

As to the Russian Japanese war, it dated from Feb. 10, 1904, to Sept. 9, 1905. The revival in the iron and steel industry, however, began late in 1904, before the mid-point between the war dates. The low point in Bessemer pig iron was in June, 1904, and in billets in October, 1904.

Pig iron and steel capacities were discussed in these columns last week. Mr. Kebler appears to be one of many to whom the "rule of doubling in pig iron" has appealed, though some observers have been disposed in recent years to lose confidence in the rule, recognizing that a geometric

ratio of increase cannot continue forever. At any rate, it is permissible to use the rule to show that a production has been unconventionally large as well as unconventionally small. Selecting other ten-year periods than Mr. Kebler has elected to employ, the following tonnage production statistics may be cited:

1889 to 1898	77,621,000
1899 to 1908	185,633,000
1909 to 1918	307,672,000

Here are three periods. The third should show four times the tonnage of the first. It shows 307,672,328 tons but should show 310,484,000 tons. That is close enough, the divergence being only nine-tenths of one per cent. So far the rule is established. Taking the mean of 307,672,328 and 310,484,000, or 309,078,000, the period 1899 to 1908 should have shown one-half as much, or 154,539,000 tons, but the production was 185,633,000 tons. Therefore, according to the rule of doubling, there was an overproduction in that period of 31,094,000 tons, and that, by the way, is precisely what many men were thinking in the last year of the period.

Prohibition and Industry

The ratification of the Federal prohibition amendment by more than the required number of States is an important event from an industrial standpoint. It is estimated that 116,000 retail liquor stores will be closed, that capital invested in the brewing and liquor business to the extent of $1,294,000,000 will be affected, that 233 distilleries and 992 breweries will be put out of business and that 794,000 men will be compelled to seek other employment. These figures and others may be cited by those opposed to National prohibition and, unfortunately, it is difficult to estimate with any degree of accuracy in dollars and cents the benefits that will come from the wiping out of the liquor traffic, but it is certain that the result which has just been recorded by the legislators has come, not so much as the result of agitation from a moral standpoint, as from economic necessity.

The prohibition movement of recent years, unlike that of an earlier period, was centered in the South and in the great industries of the North. In the South, the people, in order to overcome the terrible effects of drunkenness among colored workingmen, were willing to forget their advocacy of States' rights and vote for prohibition. It was found that the negroes working in the mines, furnaces and shops of the South worked so much better without intoxicating liquors that one Southern state after another voted for prohibition and the lesson taught by the experience of the South had important effect in the North.

One of the most impressive demonstrations of the past year was in the Connellsville coke region during the prevalence of the influenza epidemic. At that time, the saloons were closed and in spite of the fact that large numbers of miners and workers at the coke ovens were ill, the production of coal and coke rapidly increased. On the other hand, when the influenza subsided and the saloons were opened, production of the mines and ovens immediately decreased. It was also found that the temporary closing of the saloons in several large cities resulted in a very large decrease in the number of arrests and the police courts in Philadelphia and other industrial centers were almost deserted.

It is being urged that the adoption of National prohibition will make more serious the unemployment problem which is now demanding attention, but it can hardly be doubted that the nearly 800,000 men employed in the liquor business will be able to find employment where they will do more good to themselves and less harm to the country than in their present vocation. It is also reasonable to suppose that the unemployment problem will decrease in seriousness as all industries become readjusted to a peace basis.

On the whole, there is a sound basis for the expectation that the industries of the country will be greatly benefited by National prohibition.

Our Half-Yearly Index

The index of THE IRON AGE for the past half year, July to December inclusive, has been compiled and printed and is now ready for distribution. It will be forwarded promptly to those who have entered their names on our list as desiring it. Others who may have use for copies can secure them by addressing our Circulation Department.

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New Extras on Hoops, Bands and Hot Rolled Strip Steel

All makers of hoops, bands and hot rolled strip steel have issued new grades of extras in which some important changes have been made. The complete new lists as adopted by all the manufacturers and now effective are as follows:

BAND STEEL

Extras for Size

Width, Inches	Birmingham Wire Gage No. 3/16"	7	8	9	10	1/8"	11	12
¾	30	30	30	30	35	35	35	35
13/16	20	20	20	20	30	30	30	30
⅞	15	15	15	15	25	25	25	25
15/16	10	10	10	10	15	15	15	15
1	5	5	5	5	15	15	15	15
1 1/16 to 1⅝	5	5	5	5	10	10	10	10
1 7/16 to 4	Base	Base	Base	Base	5	5	5	5
4 1/16 to 5¼	Base	Base	Base	Base	10	10	10	10

HOOP STEEL

Extras for Size

Width, Inches	Birmingham Wire Gage No. 13	14	15	16	17	18	19	20
¾ and 13/16	40	40	40	50	50	55	60	65
⅞	30	30	30	35	40	40	45	55
15/16 and 1	20	20	20	25	25	30	35	45
1 1/16 to 1⅝	15	15	15	20	25	25	30	45
1 7/16 to 2	10	10	10	10	15	20	25	50
2 1/16 to 2½	10	10	10	15	20	30	40	60
2 9/16 to 3	10	10	10	15	20	30	40	
3 1/16 to 3½	10	15	20	30	40	55		
3 9/16 to 4	10	15	20	30	45			
4 1/16 to 4½	15	20	30	50				
4 9/16 to 5	15	20						
5⅛ to 5¼	20	30						

All extras are in cents per 100 lb.

Birmingham wire gage standard is always used unless otherwise specified.

No orders will be accepted for less than two tons of a size.

For intermediate gages the extra for the next lighter gage will be charged.

Size advances for hot rolled strip steel are the same as for corresponding sizes of hoop and band steel.

Additional Extras

	Per 100 lb.
Coils, scroll bundles and cut lengths 60 in. and over	No charge
Cutting to lengths over 48 in. to 59 in. inclusive	$ .05
Cutting to lengths over 24 in. to 48 in. inclusive	.10
Cutting to lengths over 12 in. to 24 in. inclusive	.20
Rounding one end of cut hoops and bands	.05
Rounding both ends of cut hoops and bands	.10
Punching one end or flaring and punching one end of cut hoops and bands	.25
Punching both ends of cut hoops and bands, flared or straight	.50

Extras for cutting and rounding one end of hoops will be waived on all widths when ordered in carload lots for cooperage purposes.

GALVANIZED HOOP AND BAND STEEL

Special prices for galvanized material will be quoted on application.

HOT ROLLED STRIP STEEL
HOOP AND BAND STEEL

Additional Extras

Per 100 lb. to be added to the base price

For deep stamping or drawing quality steel.....$0.50 extra

Cutting to lengths 60 in. and over on special stamping quality steel, without end pieces.....10% extra

Rim steel will be priced at a differential of $0.25 below deep stamping or drawing quality steel. No extra charge will be made for cutting rim steel to length.

Extras

Carbon 0.21% to 0.30% in gages No. 12 and heavier .....$0.05 per 100 lb.

For other gages of special qualities, carbon extras will be quoted on application.

Pickling and Oiling or Pickling and Liming in Cut Lengths Not Over 18 Ft., in Widths 2 in. and Over and Gages No. 16 and Heavier

Gage	Extras per 100 lb.
3/16" to No. 12	$0.25
No. 13	.30
No. 14	.35
No. 15	.40
No. 16	.45

CONTRACTORS' RELIEF

Bill Taken to Floor of Senate—Serious Difference of Opinion

WASHINGTON, Jan. 21.—The fight over the war contractors' relief bill has been taken to the floor of the Senate. The Senate Military Affairs Committee decided to present a substitute for the Dent bill, practically accepting the measure supported by the War Industries Board and the Chamber of Commerce providing for a Presidential commission to hear appeals from adjustments made by the War Department. It will be a three-cornered fight, the committee favoring its substitute, Senator Hitchcock, of Nebraska, favoring a commission to make all adjustments and the War Department objecting to the appointment of any commission at all.

Last week the committee members thought that they had taken care of the problem by accepting the Dent bill which would give the Secretary of War the power to make all adjustments, and adding to it a provision for a special Presidential commission to hear appeals. This feature was taken from the Hitchcock bill that provided for the adjustment of all contracts through such a commission. Now, however, Senator Hitchcock has refused to accept this compromise and has secured some support for insistence upon the original terms of his measure putting the entire adjustment in the hands of the commission. He takes the position that the War Department should not be made a court to determine claims to which it is itself a party.

It seems likely that the committee will decide in favor of a compromise measure, but Senator Hitchcock and his followers will carry the fight to the floor of the Senate and there will be fireworks before the measure is written into law.

The Senate committee also is expected to add to the bill a provision similar to that incorporated in the Dent measure to include in its operations the settlement of foreign contracts. Assistant Secretary of War Stettinius has returned from Europe with information bearing on this subject that will be presented to the congressional committees before the final text is accepted.

The conferees of the two houses are still at work on the war revenue bill. They have made considerable progress and the leaders of both houses believe that the measure can be reported within a week. There is still a likelihood, however, that there will be more fighting on the floor of the two houses and the final passage of the measure by Feb. 1 is far from sure.

The leaders in both houses still profess to believe that they can complete all necessary legislation by March 4 so that there will be no compulsion upon the President to call a special session during the spring. This, however, is far from certain. Even the smallest determined minority in either house could filibuster against the passage of necessary appropriation legislation and thus force the holding of a special session.

The Society of Industrial Engineers plans a national conference at New York, March 18-21, at the Hotel McAlpin. A discussion of labor by both employers and labor leaders is contemplated for the purpose of crystallizing the attitudes representative of both labor and capital toward labor problems of to-day. Internal plant organization and also the elimination of fatigue will be other leading topics. Headqurters of the society are at 327 South La Salle Street, Chicago.

The Bethlehem Steel Co. has placed a new schedule of working hours in effect at its Steelton, Pa., works. Employees in the shops will work hereafter from 7 a. m. to 4.30 p. m., with one-half hour for lunch, making a 9-hr. day. Night turns will vary in length, the shortest being 10 hours. Departments of the works to remain on 12-hr. day basis include the open-hearth plant, rolling mills, blast furnaces and coke works. Other sections of the plant will continue on an 8-hr. day schedule.

WAR BOARD DECISIONS

Unable to Enforce Some, but Continues to Announce Others

WASHINGTON, Jan. 21.—Ever since the cessation of hostilities the National War Labor Board has been trying—although so far in vain—to find a way of enforcing its awards. Joint Chairman Taft has had a long conference with Secretary of the Navy Daniels, with the announced determination of finding a way by which the power of the Navy Department could be used to attain this end, particularly in the case of the Bethlehem Steel Co. But no announcement has yet been made as to the method by which the board or the department expects to achieve this purpose.

In the meantime, the board is allowing no armistice to prevent the continuance of a grist of awards. It has just extended the wage increases ordered for puddlers and finishers in the case of the Reading Iron Co. several months ago to the Lebanon plant of the Bethlehem Steel Co., the Burden Iron Co., Troy, N. Y., the Penn Iron Co., Lancaster, Pa., the Lebanon Valley Iron Co., Lebanon, Pa., and the Cohoes Rolling Mill Co., Cohoes, N. Y. In all these cases the board orders the installation of the 8-hr. day and the election of shop committees.

Shop Committees

The board also has ordered the following companies to negotiate with shop committees of their men to fix wages that are in keeping with the increased cost of living.

Imperial Electric Co., Akron, Ohio; Smith Drum & Co., Philadelphia; Columbia Metal Box Co., New York; Eastern Steel Co., Pottsville, Pa.; Standard Steel Car Co., Butler, Pa.; American Sheet & Tinplate Co., Elwood, Ind.; and the North Lebanon Coke Plant of the Bethlehem Steel Co.

Because the complaints were not completed, the board ordered the dismissal of the proceedings begun by the International Molders' Union against the Employing Foundrymen of Marion, Ohio, and by the employees of the Steel Ship Link Belt Co., Chicago; Joseph Reid Gas Engine Co., Oil City, Pa.; and the Soo Iron & Metal Co., Minneapolis, Minn.

The General Electric Troubles

The difficulties of the various plants of the General Electric Co. are causing the National War Labor Board considerable trouble. Reports have reached Washington that the company has been replacing its strikers by reemploying them under the 1914 wage schedules and labor conditions. On this score the board has taken no action. It has, however, adopted the recommendations made by C. E. Michael and William H. Johnston as a special committee of its members. This award follows:

With regard to the troubles at Schenectady and Pittsfield, your committee believes that, since this board has made an award for these plants, and has provided a means for adjustment of any controversies arising therein, the recent strikes at these plans were in violation of this board's awards. However, since, due to changed conditions following the cessation of hostilities, the company's production at these plants has been necessarily curtailed with a consequent necessary curtailment of employees, and the company having expressed willingness to continue operating under the conditions of the award of this board, we recommend that all questions concerning any alleged discriminations, either in the curtailment of forces or the restoration of employees who went on strike, be referred for consideration and decision to Examiner Stoddard, who is now engaged in the application of this board's award at Lynn, and whose services in this capacity at Schenectady and Pittsfield shall continue for the period of the war or until it may be determined his presence is no longer necessary.

That at Erie, Pa., where the company has declined to submit to the jurisdiction of the board, your board, as a conciliatory measure, also assign an examiner, selected by the undersigned, whose duty it shall be to pass upon any alleged discriminations, either in the laying off or restoration of employees, and who shall continue at Erie in such a mediatory capacity until withdrawn by the undersigned as a section of this board.

That at Fort Wayne, Ind., any controversy that may exist be referred to the Secretary of Labor for action, as contemplated by an existing agreeement between the company and its employees which does not expire until Feb. 1, 1919.

That the examiners at Pittsfield, Schenectady, and Erie shall receive instructions from, and report to, the undersigned as a section of the board, and that any appeals from their decision be referred to this section for consideration and action.

The board has overruled the demand of the machinists of the Savage Arms Corporation that they be given the increased wage scale prepared some time ago by the Wage Adjustment Commission of the United States Shipping Board. The board, however, orders the company to pay the award made in the Rochester-Buffalo cases in October. This was accepted by the company at that time, but was rejected by the workmen, and therefore not put into effect.

By-product Ovens in the Connellsville Region

UNIONTOWN, PA., Jan. 18.—The next few months is expected to witness an immediate and rapidly expanding development of the by-product coal industry in the Connellsville region and extending into the yet undeveloped portions of the Greene county region. Initial shipments from the Buckeye Coal Co.'s plant at Nemacolin, a subsidiary to the Youngstown Sheet & Tube Co.'s by-product ovens at Youngstown, is expected within three weeks with the completion of the Buckeye plant's river tipple. This operation, within three years' time, and very probably less, will be shipping 6000 tons of coal daily, according to James A. Campbell, president of the Youngstown Sheet & Tube Co., who says: "We expect to make this the largest producer of fuel from one point in the United States, having made all our plans for a daily capacity of 6000 tons. We will add to the houses for our workmen as fast as we can develop the property and as they will all be detached houses, we believe it to be the best plan that has yet been laid out anywhere in the country."

It is understood that subsidiary interests of the United States Steel Corporation plan early operations in Greene county where recent purchases have increased the holdings of these interests to approximately 17,000 acres. The Youngstown Sheet & Tube Co. owns 7600 acres in the tract which is now being developed. In addition to these two major operations a number of sales have been made of property formerly held by J. V. Thompson and his associates with the intention of the purchasers to begin development as soon as necessary materials and supplies could be secured to open the mines. These operations are expected to begin early in the spring. In fact, Canadian interests holding a tract in this Greene county field already have begun shipments.

Coal and coke operators, particularly the by-product coal and the coke producers in this region, are not expecting any material change in the market conditions of their product during the present year, and are laying their plans to meet a heavy demand for fuel through domestic needs, reconstruction calls from abroad and what is expected to be a rapidly expanding foreign trade, several producers in the region being affiliated with the recently formed export selling organization comprising the leading independent companies in the country.

The Youngstown Sheet & Tube Co.'s annual calendar for 1919, just issued, is perhaps the handsomest of the series issued by that company. It contains 12 new views 8 x 15 in., in two colors, each showing one of the spectacular operations in a modern steel mill. The illustration on the front page is a night view of the main plant while it was speeded up on war work, and flood-lighted as a war-time precaution. This remarkable picture was made from a photographic plate which had been exposed two hours, and is regarded as a triumph of night photography. The calendar will be sent to any address on receipt of four cents in stamps to pay expense of mailing. Requests for it should be addressed to the Publicity Department, Youngstown Sheet & Tube Co., Youngstown, Ohio.

Iron and Steel Markets

BUSINESS NEGLIGIBLE

Sales Less Than Half of Production and Few for Export

Sheet and Tin Plate Mills Active—Cast-Iron Pipe Lower and Coke Easy

With new bookings less than half of current production, the industry is measurably nearer the moment of total deflation from the war basis. In many lines of finished steel there is not much over a month's work ahead. The encouraging feature from the buyer's standpoint is that labor now idle shows a disposition to resume at reduced wage rates and firm offers for steel at below present levels are now the more likely to lead to successful negotiation.

Threats of strikes in the Pittsburgh district seem unwise. Pig iron makers have been piling iron; melters are for the greater part in possession of three months' supplies; high cost plants are contemplating shutdowns, and there is no hesitation to blow out furnaces for relining and repairs. January pig iron production will be considerably below that of December.

A downward revision of coke prices, seeing that Federal control will be relinquished Feb. 1, and that capacity is now much greater than demand, is a factor in the readjustment. Offers of steam coal at below the prices ruling for some months have had no takers.

If the revival in buying is expected in the export trade, the signs are as yet wanting. Even neutral nations have not recovered from the shock of the sudden cessation of hostilities, and always hanging over is the uncertain bearing of the Paris peace deliberations.

Some 4000 tons of plates and shapes have been sold to Holland and 30,000 tons of plates have been released on the Pacific coast for Japan, but just as the horizontal cut in material prices left an expectancy of further paring, so has the scaling down in ocean freight rates had a deterrent effect on closing contracts.

While in the heavier tonnage items of finished steel, production is at a low ebb, in sheets, tin plate and wire products there is comparative activity, mills averaging 70 per cent of capacity. Nor is the country as a whole on a uniform manufacturing basis, the larger Chicago mills operating at 70 to even 90 per cent of capacity, while in the East less than 50 per cent is the rule.

Sheet mills show a 10 per cent larger demand in the three weeks of January than for the same period of December.

Price revisions have been made in cast-iron pipe in consonance with pig iron and scrap declines. The reduction is $5 per ton in Chicago and the Central West but only $3 in the East. The market, owing to limited buying of municipalities, has not been tested.

Rivets have been marked down $4 below current quotations.

Further cuts have been made in steel scrap, and it is decidedly a consumers' market.

The revising of pig iron contracts made at the old prices is proceeding steadily and inquiry shows some improvement. New England foundries are recovering from the setback of Government cancellations through increased buying by railroads and automobile manufacturers. Meanwhile merchant furnaces are apprehensive of steel companies entering the general pig iron market.

Though to be counted on only some time later, encouragement may be taken in the report of an extensive program of railroad betterments to be undertaken this year. The Union depot and terminal projects of Cleveland will require 100,000 tons of steel. The Railroad Administration has contracted for 25 barges for the Mississippi, taking 10,000 to 12,000 tons of shapes and plates.

Active negotiations for oil and gas pipe lines indicate that the construction labor conditions are favorable.

Pittsburgh

PITTSBURGH, Jan. 21—(*By Wire*).

Disquieting reports are being circulated here as to the labor situation, and at one large plant a strike has been inaugurated, while at a very large steel works measures are being taken to prevent damage to property should a strike, which at this writing seems likely, be declared. So far as known, none of the steel works in the Pittsburgh or Valley districts has directly asked its men to accept a reduction of wages, but from reliable information gathered, it seems it will be the policy of steel manufacturers to use their best efforts to maintain prices and if enough business can not be secured at present prices to operate their plants, they will be closed down. Already some companies are making plans to close certain works where high costs obtain and will simply operate to enough capacity to meet the demand as it is received. The Crucible Steel Co. of America announced last week that it had already closed two of its large works and expected to close another, all because of Government cancellations of contracts and the falling off in commercial demand for steel. There is a surplus of labor at all large manufacturing centers, but it is believed that in time men now idle will drift back to farms and other employment in which they were engaged before the war, having been drawn to the large cities on account of the very high wages they were able to obtain at plants making munitions and other war materials. It is not believed that many of the men, especially among the foreign element, have saved very much money out of their high earnings over the past two years, and their financial condition to-day is not any better than it was before the war.

General conditions in the steel trade continue very quiet. Only a fair amount of new business is being placed, and this largely to meet actual needs. There has been some betterment in demand for sheets and tin plate, also some large inquiry for pipe for gas and oil lines, but in a general way the demand for finished steel products is dull, jobbers and consumers alike buying only for actual needs. Demand for pig iron is confined largely to small lots for foundry purposes, there being no inquiry for Bessemer or basic iron. There is also no demand for semi-finished steel in the forms of billets at about $5 per ton for prompt delivery under the present recognized price. The steam coal and coke trades are pretty badly demoralized, and it is said steam coal cannot be sold, especially in Eastern markets, even

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Jan. 21, 1919	Jan. 14, 1919	Dec. 24, 1918	Jan. 23, 1918
No. 2 X, Philadelphia	$36.15	$36.15	$39.15	$34.25
No. 2, Valley furnace	31.00	31.00	34.00	33.00
No. 2, Southern, Cin'ti	34.60	34.60	37.60	35.90
No. 2, Birmingham, Ala.	31.00	31.00	34.00	33.00
No. 2, furnace, Chicago*	31.00	31.00	34.00	33.00
Basic, del'd, eastern Pa.	33.90	33.90	36.90	33.75
Basic, Valley furnace	30.00	30.00	33.00	33.00
Bessemer, Pittsburgh	33.60	33.60	36.60	37.25
Malleable, Chicago*	31.50	31.50	34.50	33.50
Malleable, Valley	31.50	31.50	34.50	33.50
Gray forge, Pittsburgh	31.40	31.40	34.40	32.75
L. S. charcoal, Chicago	38.85	38.85	38.85	37.50
Rails, Billets, etc., Per Gross Ton:				
Bess. rails, heavy, at mill	$55.00	$55.00	$55.00	$55.00
O.-h. rails, heavy, at mill	57.00	57.00	57.00	57.00
Bess. billets, Pittsburgh	43.50	43.50	43.50	47.50
O.-h. billets, Pittsburgh	43.50	43.50	43.50	47.50
O.-h. sheet bars, P'gh.	47.00	47.00	47.00	51.00
Forging billets, base, P'gh.	56.00	56.00	60.00	60.00
O.-h. billets, Phila.	47.30	47.30	51.30	50.50
Wire rods, Pittsburgh	57.00	57.00	57.00	57.00
Finished Iron and Steel, Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Common iron bars, Phila.	3.745	3.745	3.745	3.685
Common iron bars, P'gh	3.50	3.50	3.50	3.50
Common iron bars, Chicago	3.17	3.17	3.50	3.50
Steel bars, Pittsburgh	2.70	2.70	2.70	2.90
Steel bars, New York	2.97	2.97	2.97	3.095
Tank plates, Pittsburgh	3.00	3.00	3.00	3.25
Tank plates, New York	3.27	3.27	3.27	3.445
Beams, etc., Pittsburgh	2.80	2.80	2.80	3.00
Beams, etc., New York	3.07	3.07	3.07	3.195
Skelp, grooved steel, P'gh.	2.70	2.70	2.70	2.90
Skelp, sheared steel, P'gh.	3.00	3.00	3.00	3.25
Steel hoops, Pittsburgh	3.30	3.30	3.30	3.50

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Sheets, Nails and Wire, Per Lb. to Large Buyers:	Jan. 21, 1919 Cents	Jan. 14, 1919 Cents	Dec. 24, 1918 Cents	Jan. 23, 1918 Cents
Sheets, black, No. 28, P'gh.	4.70	4.70	4.70	5.00
Sheets, galv., No. 28, P'gh.	6.05	6.05	6.05	6.25
Wire nails, Pittsburgh	3.50	3.50	3.50	3.50
Cut nails, Pittsburgh	5.00	5.00	5.00	4.00
Fence wire, base, P'gh.	3.25	3.25	3.25	3.25
Barbed wire, galv., P'gh.	4.35	4.35	4.35	4.35
Old Material, Per Gross Ton:				
Carwheels, Chicago	$26.00	$26.00	$27.00	$30.00
Carwheels, Philadelphia	25.00	25.00	25.00	30.00
Heavy steel scrap, P'gh.	*17.00*	20.00	25.00	30.00
Heavy steel scrap, Phila.	*16.00*	18.00	20.00	30.00
Heavy steel scrap, Ch'go.	16.50	16.50	23.00	30.00
No. 1 cast, Pittsburgh	*23.00*	25.00	27.00	30.00
No. 1 cast, Philadelphia	24.00	24.00	28.00	30.00
No. 1 cast, Ch'go (net ton)	*21.00*	22.00	26.00	26.00
No. 1 RR. wrot, Phila.	24.00	24.00	32.00	35.00
No. 1 RR. wrot, Ch'go (net)	*16.00*	18.50	25.00	31.25
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	*$5.25*	$6.00	$6.00	$6.00
Furnace coke, future	6.00	6.00	6.00	6.00
Foundry coke, prompt	*5.25*	7.00	7.00	7.00
Foundry coke, future	7.00	7.00	7.00	7.00
Metals, Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	*20.00*	20.50	26.00	23.50
Electrolytic copper, N. Y.	*20.00*	20.50	26.00	23.50
Spelter, St. Louis	*6.75*	7.25	8.05	7.62½
Spelter, New York	*7.10*	7.60	8.40	7.87½
Lead, St. Louis	*5.25*	5.50	6.15	6.85
Lead, New York	*5.50*	5.75	6.50	7.00
Tin, New York	71.50	71.50	72.00	86.00
Antimony (Asiatic), N. Y.	*7.50*	7.75	8.00	14.00
Tin plate, 100-lb. box, P'gh.	$7.35	$7.35	$7.35	$7.75

at prices much lower than have been ruling for many months. The scrap trade is also badly demoralized, prices being weak and fully $2 to $3 per ton lower than a week ago. Makers of finished steel products figure that to reduce prices any further would not stimulate new demand, but on the contrary would increase the fear of purchasers that prices would go still lower. It is remarkable how well prices on finished steel products have held since the market was declared open on Jan. 1.

Pig Iron.—The local market is extremely dull, the only inquiry being for small lots of foundry iron wanted for fairly prompt shipment. A good many furnaces in this district, also in the two Valleys and elsewhere, have blown out for relining and repairs, and this has cut down output of pig iron, so that it will show a falling off as compared with December. Furnaces do not want to pile iron at present high costs and will blow out in preference to doing so. The inquiry of the Colonial Steel Co. for 3000 to 5000 tons of basic iron has not been closed. The present outlook for a buying movement in pig iron is not reassuring and it is not believed the demand will show any betterment for some time. Prices are holding fairly steady and it is said all the resale iron offered in this market lately has been cleaned up. We quote:

Basic pig iron, $30; Bessemer, $32.20; gray forge, $30; No. 2 foundry, $31; No. 3 foundry, $30.50, and malleable $31.50, all per gross ton at Valley furnace, the freight rate for delivery in the Cleveland and Pittsburgh district being $1.40 per ton.

Ferroalloys.—The market is extremely quiet, there being an entire absence of demand. Stocks of ferromanganese, ferrosilicon and other alloys held by customers are quite heavy. It is said that nearly all consumers overbought when the demand for steel was so urgent, expecting that this demand would continue over a year at least, but with the termination of the war and operations down to a 60 to 70 per cent basis in steel plants, consumption of alloys was cut down very materially. The 30,000 to 40,000 tons of ferromanganese released by England is having the effect of weakening prices very materially. One consumer offered recently for resale a round lot of 70 per cent ferromanganese at $150 a ton and said he would charge the difference between this price and what he paid for it to the Government. A leading maker of the lower grades of ferrosilicon has readjusted contracts made last year to conform to present prices. We now quote 70 per cent ferromanganese at $200 delivered and probably a lower price would be named on a firm offer.

We quote 70 per cent ferromanganese at $200, delivered, and 16 to 18 per cent spiegeleisen, $60, f.o.b. furnace, an addition or deduction of $3.50 per unit being made, when the manganese content is above or below the standard. Fifty per cent ferrosilicon is quoted at $125.

We quote 9 per cent Bessemer ferrosilicon at $52; 10 per cent, $54; 11 per cent, $57.30; 12 per cent, $60.60. We quote 6 per cent silvery iron, $39; 7 per cent, $40; 8 per cent, $42.50; 9 per cent, $44.50; 10 per cent, $47. Three dollars per gross ton advance for each 1 per cent silicon for 11 per cent and over. All the above prices are f.o.b. maker's furnace, Jackson or New Straitsville, Ohio, these furnaces having a uniform freight rate of $2.90 per gross ton, for delivery in the Pittsburgh district.

Billets and Sheet Bars.—There is absolutely no inquiry for either billets or sheet bars and several dealers say that even a reduction of $5 a ton or more below what are recognized as market prices would not bring any new business. A leading steel maker is reported to be offering forging billets at about $51 per ton, the recognized price being $56, f.o.b. Pittsburgh. Consumption of sheet bars by the sheet mills is a little better, but there is an ample supply of bars for both sheet and tin mill purposes.

We quote 4 x 4 in. soft Bessemer and open-hearth billets at $43.50, sheet bars $47, slabs $46, and forging billets $56 base, all f.o.b. at mill, Pittsburgh or Youngstown.

Structural Material.—The Railroad Administration has placed an order with American Bridge Co. for 25 all-steel barges for traffic on the lower Mississippi River, which will require between 10,000 and 12,000 tons of plates and shapes. Railroads are placing very few orders, and only for needed work. None of the fabricating shops is running to full capacity, and deliveries of steel can be made very promptly by the mills.

We quote beams and channels up to 15 in. at 2.80c. at mill, Pittsburgh.

Plates.—A good part of the tonnage now being shipped out by the plate mills is going to the shipbuilding interests, but it is said stocks of plates at nearly all the shipyards are very heavy. None of the steel car companies is taking any orders for steel cars, but it is said the Government has a very extensive program outlined for railroad betterment this year ,and if this is carried out it will embrace contracts for a good many thousand cars. Some of the smaller plate mills are said to be getting very short of work.

We quote sheared plates at 3c., Pittsburgh mill.

Iron and Steel Bars.—Mills report the demand for both iron and steel bars quiet, but specifications on contracts placed some time ago, all of which have been adjusted to the basis of present prices, are coming in at a fair rate. Local mills state they are still adhering to the price of 3.50c. on common iron bars in spite of the fact that the Chicago price is lower.

We quote soft steel bars rolled from billets at 2.70c.; from old steel rails, 2.80c.; common iron bars, 3.50c.; bar iron rolled from selected scrap, 3.65c.; and refined iron bars at 4.40c. at mill, Pittsburgh.

Sheets.—Makers report that the new demand for sheets is better than anticipated, and up to Jan. 20 was 10 per cent larger than in the same period in December. The foreign demand is heavy and some fairly large sales of galvanized sheets have been made for export at about domestic prices. The supply of sheet bars is good and sheet mills are operating at about 75 per cent of capacity. The mills state there is no cutting in prices, which are being firmly held. The decline in price of spelter is serving to make the 6.05c. price on galvanized sheets more profitable. Prices on sheets are given in detail on sheet 277.

Tin Plate.—Some fairly heavy specifications from large consumers of tin plate have come in the market recently and will give these mills several weeks' work. As yet few, if any, of the large can companies have placed their contracts for tin plate for this year for the reason that they carried very heavy stocks from last year, which they desire to work up before making contracts. The commercial demand is fairly active, and there is a good deal of export inquiry. Operations among the tin plate mills are better than a month ago and are averaging from 65 to 70 per cent. Not many sales have been made for export, but a large amount of business is under negotiations at present, most of it for the Far East. The supply of steel is plentiful and the tin mills are getting deliveries, in some cases faster than they can use them. We continue to quote tin plate at $7.35 per base box for domestic trade, f.o.b. Pittsburgh. Prices on terne plate are given on page 277.

Wire Rods.—Makers of wire rods report quite a heavy foreign inquiry, but state that very few sales for foreign shipment are being made, and believe this foreign inquiry is due to a desire to get a line on the actual prices of rods ruling here. The domestic inquiry is fairly heavy and sales of small lots of soft rods and also rivet and high carbon rods are fairly active. There is plenty of steel to make rods, but not enough business to keep the rod mills filled. Prices are given in detail on page 277.

Wire Products.—Mills continue to report demand quiet, jobbers and consumers buying only such quantities of nails and wire as actual needs demand. It is stated that when the war ended the Government had accumulated 800,000 to 1,000,000 kegs of wire nails. This is regarded as a menace in the wire nail trade, and there is a good deal of uneasiness to know just what the Government intends to do with these nails. If they are put on the market in large quantities and at a lower price than the mills are quoting, the effect will be to demoralize pretty badly the whole wire market. Reports are that the Government is disposed to be conservative and has asked a number of mills to include one keg of Government nails in each three or four kegs called for in orders entered by the mills. At present the wire mills are not operating to more than about 70 per cent of capacity and have not very much business ahead on their books. The mills state that prices are being firmly held and in fact claim there is no room for shading. It is said there is a fair profit in plain wire at $3.25 per 100 lb., but on wire nails some mills show a small loss each month in operation. Prices on wire products are given in detail on page 277.

Hot-Rolled Strip Steel.—New demand is quiet, but shipments by the mills are fair on old contracts placed last year on which prices have been adjusted to the present basis.

We quote hot-rolled strip steel, as made by hoop and band mills, at 3.30c. per lb., while for deep stamping or drawing quality steel, 50c. per lb. extra is charged, all f.o.b. Pittsburgh.

Cold-Rolled Strip Steel.—Makers report a fair demand from the automobile trade, but new business in general is quiet, jobbers and consumers buying only such quantities of material as are needed for actual demands.

We quote cold-rolled strip steel at $6.25 base per 100 lb., f.o.b. Pittsburgh, for 1½-in. and wider, 0.100 in. and thicker, hard temper in coils under 0.20 carbon. Boxing charge 25c. per 100 lb.

Shafting and Screw Stock.—Makers report the demand quiet and only for such quantities of shafting as are needed by jobbers to round out stocks, or by consumers to meet actual necessities. Jobbers' stocks are reported fairly heavy and they are buying cautiously. The demand from the implement trade and from the screw stock machine trade is quiet.

We quote cold-rolled shafting at 20 per cent off list in carloads and 16 per cent in less than carloads, f.o.b. Pittsburgh.

Nuts and Bolts.—Makers state that in the past week the demand for nuts and bolts has been more active and they are encouraged to believe that it will continue. Several makers have enough orders on their books and new business in sight to warrant full operation over remainder of this month and through February, but starting with March the outlook for operations is uncertain. Jobbers are placing very few orders, and only for such quantities of nuts and bolts as are needed to round out stocks. It is evident jobbers feel that prices may be lower. It is stated that discounts on nuts and bolts are being held, and these are given in detail on page 277.

Rivets.—The demand for structural and boiler rivets is light, but for hull rivets is active from the shipbuilding trade. Makers of rivets say they are pretty well filled up for the next five or six weeks, but have not much business beyond that period.

We quote button head structural rivets at $4.40 and cone head boiler rivets at $4.50 base, f.o.b. Pittsburgh.

Spikes.—Recently large inquiries for spikes for delivery up to June have come from several of the railroads, but when it came to closing contracts the roads decided they would buy only small quantities for delivery in 30 to 60 days. It is said the United States Railroad Administration is refusing to allow the railroads to buy large quantities of spikes for delivery ahead. The Grand Trunk has an inquiry in the market for 4000 kegs. The demand for boat spikes is fairly heavy.

We quote standard spikes 9/16 x 4½ in. at $3.65 and small spikes at the same price in carload lots of 200 kegs or more at $3.65 per 100 lb., plus usual extras. We quote boat spikes at $5.00 base per 100 lb. plus usual extras, in carload lots of 200 kegs or more, all f.o.b. Pittsburgh.

Hoops and Bands.—Makers report demand very quiet and are running mostly on specifications against old contracts placed last year, on which prices have been adjusted to the present basis. None of the mills rolling hoops and bands is operating to more than 60 to 70 per cent of capacity.

We quote steel hoops and bands at 3.30c. base, with the usual extras.

Skelp.—The quiet situation in the pipe trade is reflected in skelp, the demand for which is dull, and none of the skelp mills is running full, probably to not over 60 per cent.

We quote grooved skelp at $2.65, universal skelp $3.00 base. Special skelp for boiler tubes, etc., is $3.15 for bases size and $3.30 for other sizes, all these prices being per 100 lb., f.o.b. Pittsburgh.

Coke.—As stated in this report last week would be the case, the Government has announced it will remove all restrictions on prices on coal and coke on Feb. 1, and this, together with the fact that a large number of blast furnaces in Pittsburgh, the Valleys and other nearby districts, have shut down for relining and repairs, thus cutting off a large consumption of coke, has resulted in coke becoming a glut in the market. Standard brands of furnace coke have been offered in the last day or two as low as $5.25 per net ton at even, and it is said that as low as $4.75 has been named on some lower grades of furnace coke. Furnaces are shutting off shipments to some extent, and coke loaded on Saturday and Monday is still standing on the tracks. There is a plentiful supply of labor at the different coke plants and on Monday one coke works had fully 75 men applying for work, but all were turned away, as there was no work to give them. None of the blast furnace operators is making any contracts for coke, but nearly all are buying from week to week, having been expecting that the market might decline as soon as the Government removed restrictions on prices. Output of coke is creeping up and in the week ending Jan. 11 was 271,336 tons, an increase over the previous week of close to 20,000 tons. We have reduced prices and now quote standard makes of blast furnace coke for prompt shipment at $5.25, with a probability that a lower price would be made on a round lot for prompt shipment. We also quote 72 hr. beehive foundry coke at $5.25 per net ton at oven. Prices on both furnace and foundry coke are weak, and present indications are they will be lower.

Boiler Tubes.—An inquiry is reported in the market for 25,000 tons of steel skelp for shipment to Scotland, to be used in making boiler tubes. The demand for merchant and boiler tubes is light, some of the locomotive shops not being very busy and not buying as freely of tubes as formerly. Discounts on iron and steel tubes are given on page 277.

Old Material.—The local scrap market seems to be completely demoralized as far as demand is concerned, and prices are declining very rapidly. It is said that selected heavy melting scrap for open-hearth purposes has been offered to consumers in fairly large lots at $17 per gross ton delivered, and was declined. Very low prices have also been named on low phosphorus melting scrap and borings and turnings. Dealers report it is absolutely impossible to do any business in scrap under present conditions, as consumers are not interested, no matter how low prices are named. Several leading local dealers say they have not made a single sale of scrap in the past several weeks. In the absence of sales it is practically impossible to quote the market. We quote prices, largely nominal, as follows:

Heavy steel melting, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh, delivered	$17.00 to $18.00
No. 1 cast, for steel plants (nominal)	23.00 to 24.00
Rerolling rails, Newark and Cambridge, Ohio; Cumberland, Md.; Franklin, Pa., and Pittsburgh (nominal)	23.00 to 24.00
Compressed steel	16.00 to 17.00
Bundled sheet, sides and ends, f.o.b. consumers' mills, Pittsburgh district (nominal)	15.00 to 16.00
Bundled sheet stamping (nominal)	14.00 to 15.00
Railroad grate bars (nominal)	15.00 to 16.00
Low phosphorus melting stock	21.00 to 22.00
Iron car axles (nominal)	38.00 to 39.00
Locomotive axles, steel (nominal)	41.00 to 42.00
Steel car axles (nominal)	38.00 to 39.00
Railroad malleable (nominal)	19.00 to 20.00
Machine shop turnings	11.00 to 12.00
Cast iron wheels	23.00 to 25.00
Rolled steel wheels (nominal)	19.00 to 20.00
Sheet bar crop ends (at origin) (nominal)	27.00 to 28.00
Heavy steel axle turnings (nominal)	12.50 to 13.00
Heavy breakable cast	23.00 to 24.00
Cast iron borings	13.00 to 14.00
No. 1 railroad wrought	26.00 to 27.00

Wrought Pipe.—So far the order of the Cosden & Co. interests for about 300 miles of 8-in. line pipe has not been placed, but it is said the chances are good for this business to be given out in the near future. Some other heavy inquiries for pipe for gas and oil lines are in the market. One interest is inquiring for 175 miles of 8-in., another for 60 miles of 6-in. and still another for 150 miles of 6 and 8-in. pipe. The Prairie Oil & Gas Co. is inquiring for a large amount of 12-in. pipe for the laying of a line to Galveston, Tex. Other smaller inquiries include 25 miles of 12-in. and 30 miles of 16-in. pipe. The Standard Oil Co. is understood to have contracted for its entire supply of tubular goods for this year on a conversion basis, this business running into many thousands of tons. The Philadelphia Co. and other gas interests are expected to come out in the near future for their requirements of pipe and casing for spring and summer work. The commercial demand for lap weld pipe is fairly heavy, but very little is being done in butt weld sizes, owing to quiet building conditions all over the country. Mills rolling iron and steel pipe are operating at 70 to 75 per cent of capacity. Discounts in effect on iron and steel pipe are given on page 277.

Forty-five Thousand Pacific Shipyard Workers Strike

SEATTLE, WASH., Jan. 21—(*By Wire*).—At 10 o'clock this morning 30,000 members of local unions represented by the Metal Trades Council employed in steel and wooden shipyards contract shops and allied industries went on strike. Approximately 15,000 in Tacoma yards struck last night. The strike is in protest of the Macy award. The metal trades are asking $8 for an 8-hr. day for mechanics and $6 for helpers. In Seattle 150 institutions closed their gates and approximately 75 steel and wooden ships are left on the ways or uncompleted in the water. In Tacoma 25 vessels were left on the ways and in the water. The strike is expected to immediately spread to other Puget Sound shipbuilding cities and to Columbia River districts.

Will Make Ferromanganese at Sharpsville, Pa.

The expected purchase of West End blast furnace at Roanoke, Va., by Allen S. Davison & Co., Oliver Bldg., Pittsburgh, did not materialize, and as a result the Pittsburgh company has decided to operate its Sharpsville blast furnace at Sharpsville, Pa., on ferromanganese as soon as necessary plans can be made. The company is adding four 2-pass hot blast fire brick stoves to its furnace, two of which are finished and in operation, and the other two are expected to be ready about March 1. The company will use its own ores in the manufacture of ferromanganese and expects to turn out, starting about July 1, from 2000 to 2400 tons per month.

Hickman, Williams & Co., Oliver Building, Pittsburgh, dealers in coke, alloys and steel, have opened a New York office in Room 1835, Equitable Building, but after Feb. 1 will be located in Room 1548, Equitable Building. The new office will be in charge of Frank M. Welsh, who was the steel buyer and purchasing agent for the Vulcan Steel Products Co., New York, for the past 14 months. Prior to that time Mr. Welsh was connected with the Pittsburgh sales department of the Republic Iron & Steel Co. for seven years and previous to that was with Spang, Chalfant & Co. for three years and the National Tube Co. for six years. Mr. Welsh, who will be resident manager in New York, started his connection with Hickman, Williams & Co. on Jan. 15. He has a thorough knowledge of iron steel products, particularly finished lines of steel.

Coke Output Increasing

WASHINGTON, Jan. 21.—Coke production in the United States is mounting again. According to the figures of the United States Geological Survey, the beehive production during the week ending Jan. 11 was 538,000 net tons against 479,000 tons in the week of Jan. 4. A year ago, however, the production for the same week was 555,000 tons. The by-product production during the week ending Jan. 11 was 541,600 net tons against 546,298 in the preceding week.

Chicago

CHICAGO, Jan. 20 (*By Wire*)

The demand for steel specifying prompt delivery continues to improve slowly, consumers facing immediate necessity and apparently concluding it is useless to haggle over prices. January is not ordinarily an active month in steel. Export transactions with the Far East are temporarily hindered, rather than helped, by declines in Pacific freights from $45 to $30, Oriental consumers believing they will profit further by waiting. Nevertheless 30,000 tons has been placed with a Japanese shipbuilding interest, and railroad permits obtained for the shipment.

The new uniform contract now being considered by the trade is likely to be modified before acceptance, it being held that in some respects it puts the consumer in the category of enemy, especially in the matter of deliveries in which, it is pointed out by a steel producer, everything would be in favor of the mill. The principal interest is operating over 90 per cent of capacity in nearly all departments, including blast furnaces, and those rolling plates, shapes and bars. The leading independent is operating at a rate of about 70 per cent. Cast-iron pipe quotations have been reduced $5.

Pig iron is extremely quiet, but the situation is clearer, the leading Northern producer having formally announced a reduction of $3 per ton on new business, the reduction also to apply on existing contracts where circumstances warrant.

Pig Iron.—The situation with producers and sellers is a little better defined. Pickands, Brown & Co., the largest producers and sellers of Northern iron, authorize this statement: "We understand that the market price of pig iron has fallen about $3 per ton. We have followed the market and reduced prices on pig iron sold by us about $3 per ton. In view of the peculiar commercial conditions now prevailing, we have applied this reduction on some existing contracts when the circumstances seem to warrant." It is hoped that the reduction, which has practically been in effect since the beginning of the year, together with its application to existing contracts, will stabilize the market, but few expect that it will result in any greatly increased volume of business. The extent to which many consumers are supplied is well known, a majority of them having all the iron they can use for at least three months and some for many months more. The sellers are receiving many requests to hold up delivery, and in some cases the buyers want to cancel. Some Southern producers adhere to existing contracts. The situation bristles with suggestions, but that is all they are. There is talk of the wisdom of recalling all contracts and rewriting them on a strictly peace basis, spreading delivery to suit the customers. It also is suggested that some of the high cost producers might better attempt to get their customers to consent to cancellations of contracts, and then blow out their furnaces rather than run at a loss or perilous margin of profit. This suggestion, of course, has in mind Southern or Middle Western stacks which do not find $31 a profitable level. Their costs considerably exceed those of furnaces on the Lakes, principally because of the freight they must pay. On the other hand, a going business is likely to be relinquished with reluctance, even if the alternative is operating at a loss. Of the Pittsburgh meeting it is learned that the producers were in favor of eliminating old-time nomenclature of grades, because of the conflict that exists between the classifications in different territories, and selling entirely on analysis. Local pig-iron associations disapproved of their merger into one large association for the reason that as they are constituted they can hold meetings monthly or oftener and deal with sectional problems. It was maintained that a universal pig-iron association was almost impossible because of the unwillingness of some of the larger producers, notably those making steel, to come in. The matter of silicon differentials was discussed at the meeting and so far as can be learned they were left where the Government fixed them. Already there is apprehension lest the steel mills, with their lessened rate of production, may put on the market some of their surplus pig iron. Meanwhile there is a little business in prompt delivery iron, and particularly in the silveries, the largest purchase being 1000 tons by a Wisconsin melter. Export inquiries have been unsatisfactory in that they fail to result in business. A lot of 1000 tons has been shipped to China by a large interest, but this sums up its exports. Charcoal iron makers adhere to recent fourth quarter Government maximums, and have obtained more on some recent new business. In some cases, their contracts provided for the application of the price named in the contract, should official price-fixing cease.

The following quotations are for iron delivered at consumer's yards, except those for Northern foundry, malleable and steel-making irons, including low phosphorus, which are f.o.b. furnace, and do not include a switching charge averaging 50c. per ton:

Lake Superior charcoal, Nos. 2 to 5	$38.70 to $39.00
Lake Superior charcoal, C to AA	40.70 to 42.50
Lake Superior charcoal, No. 6	41.20 to 41.50
Northern coke foundry, No. 1 silicon, 2.25 to 2.75	32.25
Northern coke foundry, No. 2 silicon, 1.75 to 2.25	31.00
Northern high-phosphorus foundry	31.00
Southern coke, No. 1 foundry and No. 1 soft silicon, 2.75 to 3.25	39.00
Southern coke, No. 2 foundry, silicon, 2.25 to 2.75	37.25
Southern foundry, silicon, 1.75 to 2.25	36.00
Malleable, not over 2.25 silicon	31.50
Standard Bessemer	32.20
Basic	30.00
Low phosphorus (copper free)	52.50
Silvery, 7 per cent	47.00

Ferroalloys.—The market is entirely nominal. No one will buy at existing quotations, but a break has yet to come. On small lots of ferromanganese 15c per lb. is being obtained.

We quote 70 per cent ferromanganese nominal at $225 delivered; 50 per cent ferrosilicon at $155 to $162.50, delivered, and 16 to 18 per cent spiegeleisen at $65 furnace.

Plates.—Though high Pacific freights are tending to restrict business with the Orient, about 30,000 tons has been released to Japanese shipbuilders. Local domestic demand is appearing a little more steadily, but not in large volume. Pacific freights have dropped from $45 to $30, but instead of creating business, far Eastern buyers are looking for a further decline and are holding off. Every dollar saved in freight is as good as a reduction in price. It is felt if the freight drops to $20 Oriental consumers would accept American prices.

The mill quotation is 3c., Pittsburgh, the freight to Chicago being 27c. per 100 lb. Jobbers quote 4.27c. for plates out of stock.

Bars.—The mills have enough orders, including those from the agricultural implement field to sustain operations at a good rate for a couple of months, but new business is admittedly slow in bars of all kinds, though concrete reinforcing bars show a betterment. The quotation of 2.90c. for iron bars has not been really tested.

Mill prices are: Mild steel bars, 2.70c., Pittsburgh, taking a freight rate of 27c. per 100 lb.; common bar iron, 2.90c., Pittsburgh; refined iron bars, 3.65 to 4.40c.; rail carbon, 2.80c., Pittsburgh.

Sheets.—Demand is becoming a little livelier and this is much welcomed inasmuch as the mills have no back-log. Some of the makers increased their production just as the armistice became effective.

Chicago delivery out of stock regardless of quantity, No. 10 blue annealed, 5.17c.; No. 28 black, 6.22c., and No. 28 galvanized, 7.57c.

Mill quotations are 4.70c. for No. 28 black, 3.95c. for No. 10 blue annealed, and 6.05c. for No. 28 galvanized.

Wire Products.—No change of importance is noted aside from the action of jobbers in asking that shipments be expedited, an indication that their stocks are low. New orders are not heavy.

Cast-Iron Pipe.—Detroit's requirement of 2000 tons is unsettled. No other inquiries have come out. The makers announced a reduction of $5 per ton, this putting 6-in. pipe at $61.80 and 4-in. at $64.80.

We quote per net ton, f.o.b. Chicago, ex-war tax, as follows: Water pipe, 4-in., $64.80; 6-in. and larger, $61.80; class A and gas pipe, $1 extra.

Bolts and Nuts.—The makers are receiving numerous orders but individually they are small. A tendency toward weakness is being shown in the West, but the

general market is sustained by the business Eastern makers are receiving from the shipyards, U. S. Navy and automobile industry.

Structural rivets, 5.67c.; boiler rivets, 5.77c.; machine bolts up to ⅞ x 4 in., 40 per cent off; larger sizes 25 and 5 off; carriage bolts up to ⅞ x 6 in., 35 off; larger sizes, 20 and 5 off; box pressed nuts, square topped, 78c. off; hexagon tapped, 58c. off; coach or lag screws, gimlet points, square heads, 40 per cent off. Quantity extras for nuts are canceled.

Rails and Track Supplies.—No business in standard rails is expected for some time, but this is no great detriment, as local mills have orders which will fill several months. Spikes and track bolts have been fairly active.

Standard railroad spikes, 3.65c., Pittsburgh. Track bolts, with square nuts, 4.90c., Pittsburgh. Tie plates, steel, 3c., Pittsburgh and Chicago; tie plates, iron, 3.30c., f.o.b. maker's mills. The base for light rails is 3c., f.o.b. maker's mill, with usual extras.

Shapes.—Independent mills are comfortably booked for about two months so far as smaller sections go, but large shapes are in almost no demand. Buying is almost entirely confined to small lots needed for repairs or small undertakings. No structural lettings were announced this week.

The mill quotation is 2.80c., Pittsburgh, which takes a freight rate of 27c. per 100 lb. for Chicago delivery. Jobbers quote 4.07c. for material out of warehouse.

Old Material.—The market continues in the doldrums with transactions limited to occasional purchasing of bargain lots by one mill. The only list of consequence is one coming from the Rock Island. The railroads are showing a willingness to take low prices. Further declines are shown.

We quote for delivery in buyers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Iron rails	$28.00 to $29.00
Relaying rails	50.00 to 55.00
Carwheels	26.00 to 27.00
Steel rails, rerolling	22.00 to 23.00
Steel rails, less than 5 ft.	22.00 to 23.00
Heavy melting steel	16.00 to 16.50
Frogs, switches and guards, cut apart	16.00 to 16.50
Shoveling steel	16.00 to 16.50
Heavy steel axle turnings	12.00 to 13.00
Per Net Ton	
Iron angles and splice bars	$24.00 to $25.00
Steel angle bars	17.00 to 18.00
Iron arch bars and transoms	25.50 to 26.50
Iron car axles	31.00 to 32.00
Steel car axles	27.00 to 28.00
No. 1 railroad wrought	16.00 to 17.00
No. 2 railroad wrought	15.00 to 15.50
Cut forge	19.50 to 20.50
Pipes and flues	13.00 to 14.00
No. 1 busheling	14.50 to 15.00
No. 2 busheling	9.00 to 9.50
Steel knuckles and couplers	22.50 to 23.00
Coil springs	23.00 to 24.00
No. 1 cast	21.00 to 22.00
Boiler punchings	24.00 to 25.00
Locomotive tires, smooth	25.00 to 26.00
Machine-shop turnings	8.00 to 8.50
Cast borings	10.50 to 11.50
Stove plate and light cast	17.00 to 17.50
Grate bars	16.00 to 16.50
Brake shoes	16.00 to 16.50
Railroad malleable	16.00 to 16.50
Agricultural malleable	15.00 to 16.00
Country mixed	12.00 to 13.00

Philadelphia

PHILADELPHIA, Jan. 21.

While there is a slightly better inquiry for steel products, the volume of new business being placed is not sufficient to maintain production at its present rate of 60 to 75 per cent very long, and further curtailment at Eastern steel plants is a very definite prospect for the near future.

Mills are steadily reducing working forces or putting into effect a shorter work day and as a further measure of economy, a dollar's worth of work for a dollar's pay is being more insistently demanded of steel workers. There is no hint of any immediate reduction in wages, but it is known that one large steel company is not averse to seeing selling prices for steel go lower, believing that, if they do, the industry will be able to bring about a proportionate reduction in costs, even though it is necessary for producers to absorb a loss for a time. But it is doubted whether a sharp reduction of prices would bring out much business under present conditions, as consumers have assumed a waiting attitude which apparently they will not abandon until they see a more active demand for their manufactured products.

Two fair-sized export sales are noted, one of 4000 tons of plates, shapes and bars to the Netherlands Government and another of 600 tons of plates. Current domestic prices are reported to have been quoted on this business.

Pig Iron.—There is a slightly improved inquiry for pig iron, but actual sales have been mostly small lots for immediate delivery. We note the sale of 500 tons of gray forge iron at $33.90, delivered Philadelphia. An inquiry for 500 to 1000 tons of foundry iron, No. 2X and No. 2 plain, has been sent out by a local maker of machinery and cast-iron pipe and a Richmond, Va., stove works is asking for prices on foundry iron but no specific quantity is named. A manufacturer of railroad equipment is in the market for 1000 tons of silvery iron, half for a mid-Western plant and half for an Eastern plant. Otherwise the market is quiet. Although a few sellers have revised prices on contracts down $3 a ton, some are still debating the question with their customers. It is admitted, however, that such price revision is becoming more general and all furnaces may eventually be forced to make this concession to their trade. Two or three Virginia furnaces may soon be seeking business and the question is being raised as to the prices which they must quote to obtain orders. A Virginia furnace is reported from Pittsburgh to have sold a lot of iron on the basis of $31, furnace, but this is not confirmed. Representatives of Southern furnaces say that one or two interests are ready to sell basic at $30 or foundry iron at $31, Birmingham, but the freight rate of $6.50 will probably prevent any business being placed for shipment to this district. The prediction of J. Leonard Replogle, former Director of Steel Supply for the War Industries Board, that pig iron will go to $40 has aroused interest here, but sellers believe Mr. Replogle is too optimistic. Lower rather than higher prices are expected, though sellers cannot see how prices can be brought down very much until costs are reduced. Despite recent optimistic utterances as to the favorable position of the furnaces, there is considerable worry as to the volume of business that will stay on the books, in view of the attitude of many consumers, and a few furnaces may soon be banked for lack of business. Several in this district are now out of blast for one cause or another. We quote standard grades of iron for delivery in the Philadelphia district except standard low phosphorus, which is quoted f.o.b. furnace:

Eastern Pennsylvania No. 2 X (2.25 to 2.75 sil.)	$36.15
Eastern Pennsylvania No. 2 foundry (1.75 to 2.25 sil.)	34.90
Virginia No. 2 X (2.25 to 2.75 sil.)	39.35
Virginia No. 2 foundry (1.75 to 2.25 sil.)	38.10
Basic	33.90
Gray forge	33.90
Standard low phosphorus, f.o.b. furnace	51.00
Copper-bearing low phosphorus	48.90

Ferroalloys.—A local importer of ferromanganese will soon receive 1500 tons from England, which will be applied on old contracts made at about $160. The domestic market for all ferroalloys is dead. We quote 70 per cent ferromanganese nominally at $225, delivered, and 16 to 18 per cent spiegeleisen at $65 f.o.b. furnace.

Billets and Slabs.—Consumers are taking a little more interest in semi-finished material, especially rerolling billets and slabs. Forging billets are not in demand and a Pittsburgh producer is reported to be offering them at $51, Pittsburgh. We quote open-hearth rerolling billets at $47.30, Philadelphia.

Finished Steel.—Steel companies report a slightly better tone in the market during the past week. More orders have been placed, though the volume is by no means sufficient to give encouragement that mill operations can be continued for long at the present rate of about 60 to 75 per cent. The Netherlands Government has placed orders with a Pittsburgh interest for 4000 tons of plates, shapes and bars, and it is understood that current domestic prices were quoted. A 600-ton

export order for plates has been placed here at 3c., Pittsburgh. Building activity is practically nil, but structural steel interests believe some buildings might be started if financial arrangements could be made. Some fairly good orders for steel bars are being placed, probably three-quarters of such business booked by one mill coming from jobbers who are taking steel bars in preference to bar iron because of the great difference in price. Business in sheets is very sluggish. Though railroads are known to be in need of rails no steps are being taken, so far as reported, to supply their wants. The Railroad Administration is said to be seeking lower prices. One or two rail mills may be forced to shut down soon unless business develops.

Coke.—Removal of Government restrictions on coke Feb. 1, including control of prices, is expected by the trade to bring lower quotations. The coke supply has increased and demand has decreased, these factors being counted upon to bring out lower-priced offerings.

Bar Iron.—No action on prices has yet been taken by any of the Eastern mills, which continue to quote on the basis of 3.50c., Pittsburgh, for common merchant iron. No business is being done at this price. Lower prices will come, but producers are unable to tell just when it will be. Several mills are shut down, one by a strike of puddlers, and others because of lack of business. Puddling costs are said to be too high to permit of a price which will compete with 2.70c. steel bars.

Old Material.—The scrap market continues weak and further declines in prices are noted. Some of the weakness is attributed to the acts of dealers in forcing sales of material which they have been obliged to ship to save car demurrage. A sale of heavy melting steel at $17.75, delivered, was made last week. A large consumer has been offered a liberal supply at $16.25, delivered, but would pay only $16. Knowledge of the great tonnages of war scrap which the Government must eventually sell is undoubtedly a factor in the marked weakness of melting steel, which is selling proportionately lower than some other grades. Rerolling rails are weaker and are quoted at $18 to $20. Yard wrought, forge fire and bundled skeleton, and borings and turnings are also lower than a week ago. Scrap dealers are urging the removal of the permit system for shipping scrap which is still adhered to by the Railroad Administration despite the fact that the conditions which caused its inception have disappeared with the end of the war. We quote for delivery at consumers' works eastern Pennsylvania as follows:

No. 1 heavy melting steel	$16.00 to $18.00
Steel rails, rerolling	18.00 to 20.00
No. 1 low phosphorus, heavy, 0.04 and under	24.00 to 26.00
Iron rails	30.00 to 32.00
Carwheels	25.00 to 26.00
No. 1 railroad wrought	24.00 to 25.00
No. 1 yard wrought	20.00 to 21.00
Country yard wrought	12.00 to 15.00
No. 1 forge fire	15.00 to 16.00
Bundled skeleton	15.00 to 16.00
No. 1 busheling	18.00 to 19.00
No. 2 busheling	14.00 to 15.00
Turnings (for blast furnace use)	9.50 to 10.00
Machine-shop turnings (for rolling mill use)	11.00 to 12.00
Cast borings (for blast furnace use)	10.00 to 12.00
Cast borings (clean)	13.00 to 15.00
No. 1 cast	24.00 to 25.00
Grate bars	18.00 to 20.00
Stove plate	18.00 to 20.00
Railroad malleable	18.00 to 20.00
Wrought iron and soft steel pipes and tubes (new specifications)	18.00 to 20.00
Ungraded pipe	14.00 to 16.00

Buffalo

BUFFALO, Jan. 20.

Pig Iron.—While the market generally speaking is pretty quiet, some producers state they are finding a little better demand developing, distributed about equally among foundry and malleable grades and basic. Furnaces as a rule are not actively seeking business and are working principally on iron that was contracted for some time ago and on which specification is now coming in. A considerable aggregate of deferred delivery iron is now under request to be speeded up a little and some tonnages that furnaces had been requested to defer delivery on until February have been advanced to January shipment, which is an encouraging feature. Producers of basic iron are asking extras for manganese content, equivalent to 50c. per ton for 1 to 1½ per cent manganese and $1 per ton above base for 1½ to 2½ per cent manganese. This conforms to the extra price allowed in the Government schedule for special high manganese iron and is along the same lines as the extras allowed for the higher silicon content grades in foundry iron.

We quote as follows, f.o.b. furnace Buffalo:

No. 1 foundry, 2.75 to 3.25 silicon	$34.00
No. 2 X, 2.25 to 2.75 silicon	32.25
No. 3 foundry, 1.75 to 2.25 silicon	31.00
Gray forge	30.00
Malleable silicon not over 2.25	31.50
Basic, 1 to 1½ per cent mng	30.50
Basic, 1½ to 2½ per cent mng	31.00
Bessemer	32.20
Lake Superior charcoal, regular grades, f.o.b. Buffalo	38.50

Finished Iron and Steel.—A number of mills and selling agencies report that orders finding their way onto mill books have increased somewhat in number during the week, covering bars, shapes and plates, and while the tonnage is not large compared with the active periods of the past year, improvement is shown over recent weeks. It is understood that one of the largest inquiries for plates appearing for some time came out last week, covering requirements of a Canadian buyer for the construction of marine boilers, but that the buyer was unable to find a mill that could take on the tonnage for the delivery asked and that consequently a premium had to be paid to secure the required early delivery. Several of the largest plate producers report that for plates of ship and boiler quality they have orders for all of the tonnage they can take on for approximately five or six months, but these mills are in position to take on a considerable quantity of tank quality plates promptly, where inspection and tests are not required. One producer of the district states that inquiry has been made from the Pacific coast—supposedly for Japan, for 15,000 tons of plates.

Old Material.—There is no stir or activity in the market, which is still stagnant and likely to continue in that state for some weeks. There appears to be an entire absence of buying except on the part of a few dealers who happen to require a little material to fill up on old contracts. Mills seem to lack interest and to be as much up in the air as the dealers as to when buying is likely to be resumed. Meantime the price schedule is sagging to lower levels. We quote as follows per gross ton f.o.b. Buffalo:

Heavy melting steel, regular grades	$17.00 to $18.00
Low phosphorus, 0.04 and under	21.00 to 22.00
No. 1 railroad wrought	21.00 to 22.00
No. 1 machinery cast	23.00 to 24.00
Iron axles	27.00 to 28.00
Steel axles	27.00 to 28.00
Carwheels	24.00 to 25.00
Railroad malleable	22.00 to 23.00
Machine shop turnings	9.00 to 10.00
Heavy axle turnings	14.00 to 15.00
Clean cast borings	13.00 to 14.00
Iron rails	24.00 to 25.00
Locomotive grate bars	19.00 to 20.00
Stove plate	19.00 to 20.00
Wrought pipe	14.00 to 15.00
No. 1 busheling	15.00 to 16.00
Bundled sheet stamping	14.00 to 15.00

Birmingham

BIRMINGHAM, ALA., Jan. 20.

Pig Iron.—First sales of pig iron at $31 were made during the latter part of the preceding week, when the leading interest, which accepted the Gary schedule at the beginning, accommodated a number of customers with small lots at that figure. This company has a considerable supply of foundry iron on hand for the first time in months. Whether it intends to enter the general market in a large way is not known. On the other hand, all the independent makers adhered strictly to the $34 base and continued to dispose of small lots at that price. An IRON AGE man saw in one office several car-lot orders for Middle Western and

other delivery booked uniformly at this rate, while in others there were similar bookings, the high silicon differential being obtained in each instance. There have been a number of hold-up orders and several small consumers have tried to obtain concessions on iron booked some time ago, going so far as to say they can get it at the reduced price and intimating that they will otherwise insist on non-delivery. A regular customer of an independent company, when quoted $34, said he could get it elsewhere in the district at $31, and later said he had done it. As the leading interest is quoting $31, there does not appear to be any mystery involved. At the close of the week, there was no apparent disposition of the independents to part from their $34 schedule even when they learned the action of the leading interest in selling at $31. The independents will stick to the $34 just as long as they can under the present comfortable state of order books. The great apprehension is that selling at $31 would mean insistence in marking down on other business even in face of the iron-clad nature of the contracts specifying the latest Government price in case the Government lifted its hand. The Tennessee company has resumed at one Bessemer stack, but three there and Alice were still banked at the close of the week and one at Bessemer was out for relining. The Trussville furnace has also blown out and there is speculation as to when it will resume. Talladega continues repairs. Woodstock is down pending rebuilding of the sintering plant destroyed by fire. Raw material difficulties are responsible for the Tennessee company banking and resumption is scheduled as raw material is available. Charcoal iron is still reported at $51 with some sales made. We quote per gross ton f.o.b. Birmingham district furnaces for prompt delivery by leading interest and independents, respectively, as follows:

No. 2 foundry and soft	$31.00 to $34.00
Basic	30.00 to 33.00

Cast-Iron Pipe.—Prices have been reduced to $55 per ton, but the reduction has not resulted in business. Operations are at a low ebb with very little inquiry either in soil or water pipe.

Coal and Coke.—Coal operators are busy figuring on new conditions expected to arise when the Government lifts price fixing. Executive meetings have been held, but little given out other than the suggestion that prices to consumers will not be lowered. The mine field is still short of men. Production lags. Furnace coke is very scarce.

Old Material.—The scrap market appears to have surrendered absolutely to the consumer, prices having declined in several particulars, notably heavy melting steel, of which as much as 3000 tons were purchased during the week at the reduced level given below. A volume of business has commenced to move at the battered down schedule. We quote per gross ton f.o.b. Birmingham district yards, prices to consumers as follows:

Old steel axles	$28.00 to $30.00
Old steel rails	16.50 to 17.00
Heavy melting steel	15.00 to 15.50
No. 1 railroad wrought	20.00 to 21.00
No. 1 cast	20.00 to 20.50
Carwheels	20.00 to 20.50
Tramcar wheels	19.50 to 20.00
Machine shop turnings	8.00 to 8.50
Cast iron borings	8.00 to 8.50
Stove plate	13.00 to 13.50

New York

NEW YORK, Jan. 21.

Pig Iron.—Reports from New England, especially from Connecticut, are more optimistic than has been expected. In Bridgeport and other Connecticut cities in which many contracts for munitions were canceled, leaving plants with almost no orders on their books, the readjustment is proceeding slowly, but with reason for hoping that the period of light business will not be greatly prolonged. Some foundries, including those making malleable castings, are obtaining a fair amount of business from the railroads and automobile manufacturers, and there is also a little export business. Another encouraging feature is the large number of inquiries from many buyers, although the actual business resulting is not of large volume. Among inquiries pending in this district are one for 1000 tons of Bessemer ferrosilicon for export and another of 500 tons of the same alloy for domestic use; one for 2000 tons of foundry grades for delivery in the East during the first half of the year and one for 1000 tons of silvery. Readjustment of contracts is continuing, but in an increasing number of cases prices are reduced to the new schedule. Buffalo iron is being sold in this territory on a basis of $31, furnace, or $34.90, New York, for No. 2 plain. For delivery after the opening of canal navigation, this price will be reduced to $34.10. We quote prices as follows for tidewater delivery for Northern and Southern grades:

No. 1 foundry, silicon, 2.75 to 3.25	$37.90 to $38.30
No. 2 X, silicon, 2.25 to 2.75	36.15 to 36.55
No. 2 plain, silicon, 1.75 to 2.25	34.90 to 35.30
No. 2 X, Virginia, silicon, 2.25 to 2.75	36.40
No. 1 Southern (all rail)	39.95
No. 2 Southern (all rail)	38.70

Ferroalloys.—There is no demand, not even in carload lots. Production is falling off, a number of furnaces in the East which were on ferromanganese and spiegeleisen having gone out of blast. Output in December fell off sharply from that of November, but the January production will show a much greater decrease. It is difficult to quote prices, as there are none except the nominal quotations of producers, and as there has not been any business to test prices it is impossible to predict to what basis the market might move. A single carload of ferromanganese is reported to have been sold at $200 per ton, but this has little bearing on the general situation. Producers quote $225, delivered, for the 70 per cent and from $60 to $65, f.o.b. furnace, for 16 to 18 per cent spiegeleisen.

Finished Iron and Steel.—It is a matter for comment in the trade that mills engaged in practically every line of finished iron and steel are now greatly in need of business. In some instances it is only a question of a few weeks or less before there will be a marked curtailment of operations unless business is forthcoming in the meantime. About the time the armistice was signed it was expected that the railroads would come into the market for rails as soon as it was apparent that rails mills would be able to take orders, but this expectation has proved a disappointment, and at least two or three rail mills are in need of business and the Railroad Administration shows no apparent disposition to buy at present prices. The shipbuilding and car and locomotive building industries were expected to keep the plate mills fairly well engaged even after the coming of peace, but this also has not materialized, for the shipyards now have fairly large stocks of steel on hand, and plate shipments for shipbuilding probably are not more than 50 per cent of the schedules in effect during the latter months of the war. This curtailment is partly due to the cutting down of overtime and Sunday work at the shipyards and also to the large reservoir of steel which was banked up by the Emergency Fleet Corporation. The possibility that railroad buying will be still further curtailed is disappointing. An axle plant completed not long ago is idle, and probably will remain so for some time. Building activity is at a very low point. In fact, there is a decided lack of demand for all rolled products except for immediate requirements. Since the first of the year a number of fair-sized export orders have been booked, but all of these have been for work now in hand, and in no case are export buyers buying ahead any more than are domestic buyers. The American Locomotive Co. is getting bids on steel required for 110 locomotives, an order for which has just been received from the Railroad Administration. The American Bridge Co. has taken an order for 200 tons of fabricated steel for the Boston elevated road. The McClintic-Marshall Co. will furnish 250 tons for two caissons at the Norfolk Navy Yard drydock. Bids on 16,000 tons of fabricated material for the New York subway extensions have been rejected. It is learned that the Navy Department awarded the contract for 20 radio towers at Monroe, N. C., to the McClintic-Marshall Co., but has since

ordered suspension of the work, whether temporarily or permanently has not been announced. The job involved 6000 tons of steel. Makers of bar iron have not yet announced a change in price, and are still quoting 3.50c., Pittsburgh, for common merchant iron, but no business is being done on this basis. Jobbers are in most cases substituting steel bar for bar iron. We quote mill shipments as follows: Steel bars, 2.97c.; shapes, 3.07c.; plates, 3.27c.; common bar iron, 3.77c.; refined bar iron, 5.27c., all New York. Out of store prices are as follows: Steel bars, 3.97c.; structural shapes, 4.07c.; plates, 4.27c.; No. 10 blue annealed sheets, 5.17c.; one-pass cold-rolled black sheets, No. 28 gage, 6.22c.; No. 28 galvanized sheets, 7.57c.; hoops, 4.57c.; bands, 3/16 in., Nos. 10 and 12, 4.57c.; shafting, plus 9 per cent off list.

Cast-Iron Pipe.—Although prices of cast-iron pipe have been reduced $5 a ton in the Central West and in the South, Eastern shops are so far quoting only $3 below recent prices. This is not regarded as a bottom price, and it will be tested as soon as business of any importance develops. While manufacturers state that prices will be regulated by that of pig iron, buyers point out that the price of scrap should also be considered. The prices are: for 6 in. and heavier, $64.70, New York; for 4 in., $67.70; for 3-in., $74.70, and $1 additional for class A and gas pipe.

Old Material.—Very little business is being transacted and the tendency is toward lower quotations. As mills are fairly well supplied, it does not seem probable that they will buy to any large extent in the near future. We quote buying prices of dealers and brokers per gross ton, New York, as follows:

Heavy melting steel	$15.00 to $15.50
Rerolling rails	17.00 to 18.00
Relaying rails	50.00 to 55.00
Iron and steel car axles	26.00 to 27.00
No. 1 railroad wrought	19.00 to 20.00
Wrought-iron track	15.00 to 16.00
Forge fire	12.50 to 13.00
No. 1 yard wrought, long	17.00 to 18.00
Light iron	6.00 to 7.00
Cast borings (clean)	10.00 to 11.00
Machine shop turnings	8.00 to 9.00
Mixed borings and turnings	8.00 to 9.00
Iron and steel pipe (1 in. minimum diameter), not under 2 ft. long	15.00 to 16.00
Stove plate	16.50 to 17.00
Locomotive grate bars	16.50 to 17.00
Malleable cast (railroad)	16.00 to 17.00
Old carwheels	23.00 to 24.00

Prices which dealers in New York and Brooklyn are quoting to local foundries, per gross ton, are:

No. 1 machinery cast	$25.00 to $27.00
No. 1 heavy cast (columns, building materials, etc.), cupola size	24.00 to 25.00
No. 1 heavy cast, not cupola size	18.00 to 19.00
No. 2 cast (radiators, cast boilers, etc.)	17.00 to 18.00

St. Louis

ST. LOUIS, Jan. 20.

Pig Iron.—Little tendency to buy pig iron is appearing in this market and the conditions show practically no change from those previously reported. Consumers have enough on hand for imperative needs or are covered by undelivered tonnages and, therefore, are content to await further readjustment, not altogether in the way of lower prices, but rather for the reason that a greater degree of stabilization will enable them to determine their future course on their own contracts for business. As usual, some small lots were disposed of by furnace representatives, but nothing which could be construed as making a market. The coming month, however, is still expected to develop consumers' tendencies, according to representatives.

Coke.—Practically no business is being done on coke, save for a little selling of domestic. No metallurgical coke contracts are being placed and no price developments have been noted during the week.

Finished Iron and Steel.—While increasing interest is being shown by consumers in structural material, no contracts of moment are developing, as the present interest is chiefly with a view to making preparations for prospective spring business, of which a considerable amount is reported as due to appear on the architect's boards for bids as the approach of spring warrants the taking of bids. Structural material is held at 2.80c., bars at 2.70c. and plates at 3.00c. by the mills. Warehouse business continues rather quiet with quotations for stock out of warehouse as follows: Soft steel bars, 4.04c.; iron bars, 4.04c.; structural material, 4.14c.; tank plates, 4.34c.; No. 8 sheets, 5.19c.; No. 10 blue annealed sheets, 5.24c.; No. 28 black sheets, cold rolled, one pass, 6.29c.; No. 28 galvanized sheets, black sheet gauge, 7.64c.

Old Material.—Even trading among dealers in scrap has descended to a minimum and all are awaiting developments, preferring not to commit themselves until consumers show more interest in the market. Immediate needs of consumers are at a minimum and, in consequence, dealers are having little occasion to enter the market to meet contract requirements, while offerings from railroads and other sources are helping to keep prices down, as sales are only made at figures which the larger dealers regard as sure of profit-making to them. The smaller dealers are sitting tight and doing no more than necessary to meet engagements. The market is very soft and there are no transactions to establish prices. Nominal dealers' buying prices, f.o.b. customers' works, St. Louis industrialist district, follow:

Per Gross Ton

Old iron rails	$27.00 to $27.50
Old steel rails, rerolling	21.50 to 22.00
Old steel rails, less than 3 ft	18.50 to 19.00
Relaying rails, standard sections, subject to inspection	45.00 to 50.00
Old carwheels	22.00 to 22.50
No. 1 railroad heavy melting steel	18.00 to 18.50
Heavy shoveling steel	17.00 to 17.50
Ordinary shoveling steel	16.00 to 16.50
Frogs, switches and guards, cut apart	18.00 to 18.50
Ordinary bundled sheet scrap	11.00 to 11.50
Heavy axle and tire turnings	12.00 to 12.50

Per Net Ton

Iron angle bars	$22.00 to $23.00
Steel angle bars	16.00 to 16.50
Iron car axles	29.00 to 29.50
Steel car axles	25.50 to 26.00
Wrought arch bars and transoms	24.00 to 24.50
No. 1 railroad wrought	18.00 to 18.50
No. 2 railroad wrought	17.00 to 17.50
Railroad springs	15.00 to 15.50
Steel couplers and knuckles	15.00 to 15.50
Locomotive tires, 42 in. and over, smooth inside	14.50 to 15.00
No. 1 dealers' forge	12.50 to 13.00
Cast iron borings	10.00 to 10.50
No. 1 busheling	15.50 to 16.00
No. 1 boilers cut to sheets and rings	10.50 to 11.00
No. 1 cast	16.50 to 17.00
Stove plate and light cast	14.00 to 14.50
Railroad malleable	14.00 to 14.50
Agricultural malleable	13.00 to 13.50
Pipes and flues	12.50 to 13.00
Heavy railroad sheet and tank	11.00 to 11.50
Railroad grate bars	11.00 to 11.50
Machine shop turnings	10.00 to 10.50
Country mixed	11.50 to 12.00
Uncut railroad mixed	12.00 to 12.50
Horseshoes	16.00 to 16.50

British Iron and Steel Market

Growing Demands, Rolled Iron Advances But Increasing Labor Troubles

(*By Cable*)

LONDON, ENGLAND, Jan. 22.

There is continued scarcity of foundry pig iron. Home demand is good, but there is less business for the Allies, who appear well supplied. A growing demand from neutral nations is noted, but licenses are unobtainable. Demand for home railroad material is looking upward, as is also export trade. Egypt wants 30,000 tons of steel sleepers, but specifies British product only.

Bar iron for home use is advanced to £16 5s.; iron plates, ¼ in. and upward, £19; under ¼ in. to 3/16 in., £19 10s.; marked bars, £18 10s. Fourteen tin plate mills resumed operation in December. Prices are pointing upward. The 8-hr. day has been arranged for the Midland Iron and steel trade. Colliers demand a 6-hr. day and 30 per cent advance in present earnings. Following are the revised official domestic maximum prices for

steel, applicable after Feb. 1, 1919, per gross ton, net f.o.b. makers' works:

Ship, bridge and tank plates, £14 [11 10s.].*
Boiler plates, £15 [£12 10s.].
Ship, bridge and tank plates, thin, £16 [£14 10s. to £17 10s.].
Angles and bulb angles, £13 12s. 6d. [£11 2s. 6d.].
Small angles, tees and flats, £16 10s. [£14 to £16].
Reams, £13 12s. 6d. [£11 2s. 6d.].
Rails, 60 lb. per yd. and upward, £13 7s. 6d. [£10 17s. 6d.].
Rounds, squares and hexagons, £14 5s. [£12 10s. to £13].
Small rounds, squares and hexagons, £16 10s. [£15 to £15 10s.].
Blooms, billets and slabs for rolling, £11 12s. 6d. [£10 7s. 6d.].
Blooms, billets and slabs for forging, £12 15s. [11].
Ingots for rerolling, £9 5s.

*Prices in brackets are the official control prices for domestic business effective till Feb. 1.

Old Export Contract Prices Advanced—New Peace Business Not Developing

(By Mail)

LONDON, ENGLAND, Dec. 24.—Circumstances do not favor any great developments in the steel world nor in markets generally here. Christmas, falling as it does, in the middle of the week, has afforded an excuse for a rather lengthier holiday than usual, enabling workers to indulge in a well-earned rest. During the protracted period of the war this industry has, like its prototype in the United States, been in such an abnormal state all effort being concentrated on turning out war and shipbuilding material, that in the past 12 months really no market can be said to have existed. The great magnitude of the call for steel made far-reaching restrictions absolutely essential and the strictest control necessary. The ordinary consuming demand had to be curtailed accordingly, and projects of no immediate necessity held up. A large absorbing power is therefore in reserve and should prove welcome. Unfortunately with the signing of the armistice new peace business has not developed so quickly as might have been desired, buyers being unwilling to pay the prices demanded. As will be recollected, in fixing new prices for the home trade the authorities found it necessary to advance the level of values, and this proved discouraging to possible buyers.

The export steel situation is highly unsatisfactory—the aftermath of the ill-advised subsidies. The position now is that throughout the market contracts entered into years ago, but not executed owing to war exigencies, stand a very good chance of being canceled. To take a concrete case: Buyers in an overseas market purchased 5000 tons of certain iron and steel about the middle of 1916, the contract being made with works through London merchants. Owing to the war it was not possible for the works to roll the material, and delivery was therefore inevitably postponed. Now that war orders are "off" the works want to get on with their arrears, but the government demands that the contract price of all unexecuted orders for export be raised to the present official export level, which in this particular case means an increase of £5 5s. per ton. Unless this charge is passed on to the buyer the authorities state that they will not allow the material to be shipped at all. Naturally the buyer refuses. He thought that his contract was a contract, and he has no intention of paying a fine of £5 5s. per ton for the privilege of being permitted to take delivery of British material bought at an agreed price two and a half years ago. He will go without—or buy in a cheaper market abroad. It may be of interest to give the exact wording of the official reply to protests:

> The imposition of an export drawback does not alter the liability of a maker under his contracts, but licenses for export will only be issued if the drawback is paid, and the new export prices charged to the customer abroad.

After this official talk of the desire to restore our export trade becomes humorous, particularly when one remembers that big tin-plate merchants have been refused export permits for Welsh tin plates, and told to buy American material for their overseas customers.

The Wason Mfg. Co., Springfield, Mass., will resume activities at the plant lately operated by the Springfield Aircraft Corporation and renew its manufacture of trolley cars.

Cleveland

CLEVELAND, Jan. 21.

Iron Ore.—There is a general disposition in the iron ore trade, in view of the present condition of the iron and steel market, not to attempt to make sales for some time. Prices are not being considered, but ore men say that as mining costs have not decreased, they cannot sell ore at prices lower than were established by the Government for the last quarter of 1918. Furnaces generally have large stocks of ore. Shipments from the docks during December were surprisingly large considering the fact that little of the ore was needed. The heavy shipments during that month are attributed to the fact that consumers took advantage of favorable weather conditions to lay in stocks rather than suffer the experiences they went through a year ago in securing a delivery of ore during the most severe weather of that winter. We quote, delivered lower Lake ports, as follows:

Old range Bessemer, $6.65; old range non-Bessemer, $5.90; Mesaba Bessemer, $6.40; Mesaba non-Bessemer, $5.75.

Pig Iron.—A few sales of foundry iron in small lots for early shipment, the largest being 500 tons, are reported, but the aggregate tonnage disposed of is small. Some consumers who sent out inquiries early in the month have decided to postpone buying. There is apparently no shading of regular prices. Furnaces generally are now piling iron. Foundry operations have fallen off materially, and consumers are asking that shipments be held up. Producers continue to readjust to the present prevailing prices contracts taken at the Government prices prevailing before Jan. 1. One producer has adopted the policy of requiring the consumers to pay the last Government price for undelivered iron which will be used in filling orders for castings taken on the basis of the Government pig iron prices. But in case the foundry has found it necessary to revise its prices for castings or if the iron is to be used for filling new contracts taken by the foundry, the price is to be reduced to the present basis. This producer has found that by following this adjustment rule it must make the deduction on 100 per cent of the undelivered iron in the case of most of its trade. Most of the Southern furnaces are still holding to the old Government prices and are declining to revise contracts. They say that if they should make the reduction in contracts it would be necessary for them to also reduce prices on the contracts already taken for the first half. We quote, delivered Cleveland, as follows:

Bessemer	$33.60
Basic	30.40
Northern No. 2 foundry	31.40
Southern No. 2 foundry, silicon, 2.25 to 2.75	37.25
Gray forge	30.40
Ohio silvery, 8 per cent silicon	46.90
Standard low phosphorus, Valley furnace	51.00

Coke.—The coke trade is uncertain what effect the removal of the Government price regulation on Feb. 1 will have. A great deal of by-product coke has been sold with the contract provision that after the Government supervision is removed the price will thereafter be the regular market price. A small amount of Connellsville foundry coke is moving at the Government price.

Finished Iron and Steel.—Mills are getting a good volume of inquiries and orders from manufacturers in various lines, but only for small lots for early requirements. The aggregate tonnage booked is not large. A few inquiries for good sized lots have come out for estimating purposes. Some demand has sprung up from boiler manufacturers for plates and tubes. Truck tire and rim manufacturers are considering the adoption of a standard design of section for truck rims, and some good orders for rim steel are expected to be placed when this standardization is effected. Many of the mills are now getting in a better position to make deliveries, and this is particularly noticeable of cold rolled shafting. An Eastern mill that has been holding to the old prices is now quoting the new prices on steel bars. There is some demand from the implement trade for hard steel bars, which are selling at the same price as soft steel. Cleveland mills are now meeting the 2.90c., Pittsburgh, price for bar iron for the West-

ern trade, but are asking higher prices for the Eastern shipment. The demand is light. Plate mills generally have orders that will keep them busy for several weeks. Considerable export inquiry for plates is coming from brokers, but so far little of this is materializing into orders. It is estimated that the Union depot and terminal projects in Cleveland will require fully 100,000 tons of steel, but it will be months before any of this is placed. The Massillon Bridge Co. has taken 200 tons of structural material for a new plant for the Glass Coating Co., Cleveland. The demand for sheets in small lots has improved. Some resale sheets are being offered at a price concession. Warehouse prices are as follows:

Steel bars, 3.87c.; plates, 4.17c.; structural material, 3.97c.; No. 10 blue annealed sheets, 5.07c.; No. 28 black sheets, 6.12c.; No. 28 galvanized sheets, 7.47c.

Bolts, Nuts and Rivets.—The rivet market is not steady, and some manufacturers are quoting prices $4 a ton below regular prices, giving the buyers the advantage of the reduction in steel prices. The demand has fallen off considerably. The demand for bolts and nuts is light, but prices are apparently being maintained. Manufacturers claim that with three wage advances since the present prices were established they will not be able to make price reductions unless wage scales are readjusted. Conditions of the trade will be discussed at a meeting of the Bolt, Nut and Rivet Institute to be held in New York Wednesday.

Old Material.—Following the moderate volume of buying by some of the mills noted last week, the market is again very quiet and practically no sales larger than carload lots were reported by consumers. Yard dealers are laying down stocks, particularly turnings, for which they are paying $10 and under, and heavy melting steel, for which they are offering $16 to $17. Some heavy melting steel has sold at $17.50 and dealers are reported to be offering $18 for this grade for delivery to Monessen. Busheling has sold as low as $17 to a dealer. Borings are in fair demand. Nearly all grades can be bought at very low prices for small lots, but dealers claim that consumers would have to pay higher than the present minimum prices for round tonnages. While prices on some grades have declined, scrap does not now show a further downward trend. Dealers are uncertain about the future, but feel that prices must go back to higher levels or pig iron and steel must come down. The local situation has improved materially as to deliveries, as mills with one exception are now taking material. We quote, delivered consumers' yards in Cleveland and vicinity, as follows:

Steel rails	$19.00 to $20.00
Steel rails, under 3 ft	24.00 to 25.00
Steel rails, rerolling	25.00 to 26.00
Iron rails	27.00 to 28.00
Iron car axles, nominal	37.00 to 38.00
Steel car axles, nominal	37.00 to 38.00
Low phosphorus melting	23.00 to 24.00
Heavy melting steel	18.00 to 19.00
Cast borings, nominal	13.00 to 14.00
Iron and steel turnings and drillings	9.00 to 10.00
Compressed steel	19.00 to 20.00
No. 1 railroad wrought	22.00 to 23.00
Cast iron carwheels	23.00 to 25.00
Agricultural malleable	20.00 to 21.00
Railroad malleable	24.00 to 25.00
Steel axle turnings	16.00 to 17.00
Light bundled sheet	11.00 to 11.50
No. 1 cast	22.00 to 23.00
No. 1 busheling	17.00 to 18.00
Railroad grate bars	16.00 to 17.00
Stove plate	16.00 to 17.00

Cincinnati

CINCINNATI, Jan. 21—(*By Wire*).

Pig Iron.—Southern Ohio furnaces have reduced quotations $3 a ton to conform with other producing districts. No contracts have been made at the new prices, as consumers are holding back in putting out any inquiries for future shipment, and it remains to be seen whether this readjustment will create any interest. There seems to be a misunderstanding regarding the quotation on Southern foundry of $31, Birmingham, which has been openly made by two producing interests. Practically no iron is sold now on a fracture grading and as business is being transacted on an analysis basis some consumers have been confused by the change made in the South to 1.75 to 2.25 per cent silicon as a basing analysis for No. 2 foundry. Melters are disposed to contend for a higher silicon content to conform with the general rule of Southern furnaces in the past. Sales are very much limited, but one Central Western melter bought approximately 1100 tons of Southern foundry iron for shipment in the first half, but other sales are confined almost entirely to some special irons that are needed for immediate use. Practically no interest is taken in malleable or basic, although holdup or cancellation orders from melters of these irons are comparatively scarce. Readjustment of foundry contracts are still under way, but each case is considered on its own merits.

Based on freight rates of $3.60 from Birmingham and $1.80 from Ironton, we quote, f.o.b. Cincinnati:

Southern coke, No. 1 foundry and 1 soft	$35.85
Southern coke, No. 2 foundry and 2 soft	34.60
Southern coke, No. 3 foundry	34.10
Southern No. 4 foundry	33.85
Southern gray forge	33.60
Ohio silvery, 8 per cent silicon	49.30
Southern Ohio coke, No. 1	34.05
Southern Ohio coke, No. 2	32.80
Southern Ohio coke, No. 3	32.30
Southern Ohio malleable Bessemer	33.30
Basic, Northern	31.80
Standard Southern carwheel	51.60

Finished Material.—The mills are sending forward overdue shipments as fast as possible, and jobbers' stocks that have been at a low water mark for some time past are now being replenished rapidly. Outbound shipments are running very much behind receipts from the mills. There is a tendency on the part of the buyer to scrutinize closely the new contract forms, and from some quarters there are complaints that these contracts are somewhat one-sided and are drawn too much in favor of the mill. However, it is expected that these difficulties will be ironed out at an early date. There is a better demand for both wire nails and barbed wire from the hardware trade, but purchases are limited to smaller amounts than usual.

The following are store prices: Steel bars, 3.93c.; steel bands, 4.53c.; small structural shapes, 4.03c.; plates, 3/16-in. and heavier, 4.23c.; blue annealed sheets, Nos. 8 to 16, 5.13c. base; cold rolled shafting, 9 per cent plus list; twisted bars, 4.05½c., and wire nails, $4.25 per keg base.

Coke.—There is a much better supply of both furnace and foundry coke, which is partly attributed to the declining consumption of both grades. Production in some districts is also on the increase, and as a natural consequence there is more of this class of fuel to be had than for some time past. The removal of price restrictions on Feb. 1 will hardly bring up any new problems, as selling agents state that the law of supply and demand will control the market, as at all times during the past. Such coke as is now being sold is bought at the Fuel Administration's maximum price, but there is no future contracting at any figures. Taken as a whole, the market is developing some soft spots that may bring about a downward change in prices when competition is renewed.

High Speed Steel.—Business is somewhat irregular, although there are some orders that are constantly being received by selling agencies from their regular customers. The price of most standard brands remains at $1.90 per lb., although it is rumored that some kinds of high-speed steel have been sold as low as $1.50.

Old Material.—Heavy offerings of scrap from the railroads and also from some contractors who had war business in hand have tended to bear the market considerably. The reduced consumption of both foundry and steel mill scrap also has something to do with present conditions. Both the foundries and steel mills have their yards well filled with scrap, while dealers' stocks are increasing at a rapid rate. There is little demand from any source. Dealers are making very low offers and are indifferent about taking in any metal except at bargain figures. Offers from melters of steel scrap in the Pittsburgh district are occasionally noted, especially grades for filling in, but they are also very low. Practically every grade of scrap has been marked down from 50c. to $3.50 a ton. The fol-

lowing are nominal buying prices f.o.b. cars, Cincinnati and southern Ohio, in carload lots:

Per Gross Ton	
Bundled sheet	$11.00 to $12.00
Old iron rails	18.50 to 20.00
Relaying rails, 50 lb	32.50 to 33.00
Rerolling steel rails	19.00 to 19.50
Heavy melting steel	15.50 to 16.00
Steel rails for melting	16.00 to 16.50
Old carwheels	16.50 to 17.00
Per Net Ton	
No. 1 railroad wrought	$17.00 to $17.50
Cast borings	7.00 to 7.50
Steel turnings	6.50 to 7.00
Railroad cast	18.50 to 19.00
No. 1 machinery	20.00 to 20.50
Burnt scrap	13.00 to 13.50
Iron axles	26.00 to 27.00
Locomotive tires (smooth inside)	21.00 to 22.00
Pipes and flues	12.00 to 13.00
Malleable cast	13.50 to 14.50
Railroad tank and sheet	9.50 to 10.00

The Outlook for Exports

S. C. Munoz, president of the Federal Export Corporation, New York, sailed on Wednesday for England, and before leaving made the following statement to THE IRON AGE as to export prospects:

"I believe that recent events have changed the world's commercial conditions, and that it is absolutely necessary in the interest of general progress and the advance of civilization that there be a very intimate interchange of commodities between all nations. The commercial boundary line must cease to exist and a successful so-called export house, in order to meet any measure of success, will of necessity have to trade throughout the world and accept in payment for materials which it has for sale—regardless of their source—commodities produced in the country to which it sells.

"So far as we, the United States, are concerned, the magnificent merchant marine which we are creating will be a source of enormous expense to us, and will eventually disappear from the seas unless our international merchants will provide cargoes for these ships for each and every leg of every journey which they make. This presents the necessity of our purchasing materials in all parts of the world and, in a measure, either controlling or being interested in raw products of all kinds as well as finished products. The banker, manufacturer, ship owner and the international merchant, commonly known as the exporter, constitute the four salient and essential necessities for the creation of an export trade in this country, the establishment of dollar exchange and the maintenance of the United States as one of the financial centers of the world, and unless they co-operate and co-ordinate, we will have difficulty in maintaining the position which we have acquired so recently.

"The United States should be and may be a greater factor in the world's steel business than it was prior to 1914, when it occasionally became a factor, dependent upon two things—the extent of our desire to sell, and, what is more important, the extent of the willingness of the English, French, Belgian, Japanese and German international merchants to favor us with orders. At least 85 per cent of the United States' export steel trade was transacted through foreign export houses, and it may continue to be done in this way. The American export houses and international merchants do not appear to have as good standing in this country as the foreign merchants have. There is now considerable surplus steel capacity in England, and there will be more in France and Belgium in the near future; it is also apparent from the efforts being made here at present that it will be possible for American merchants to do business with them advantageously, and by so doing will assist the American merchant marine in taking cargoes away from Europe in exchange for the cargoes which they carry to Europe.

"I expect to meet some of the steel producers in Europe while there and anticipate learning considerable about the world's trade in general. London is the greatest selling market in the world as well as the greatest buying center. We anticipate that our London office will be in full working operation in a short time."

IRON AND INDUSTRIAL STOCKS

Buying Movement Waits for More Definite Trend in Work of Reconstruction

NEW YORK, Jan. 20.

The market closed last week at slightly lower levels, due to offerings exceeding buying demand, which was noticeably weak. Both investors and speculative interests apparently are remaining inactive, pending a more definite trend in the evolution of reconstruction. United States Steel common closed the week at 90, its lowest level in some months.

The range of prices on active iron and industrial stocks from Tuesday of last week to Wednesday of this week was as follows:

Allis-Chalm. com.	30 - 33¾	Int. Har. pf.	118
Allis-Chalm. pf.	81¾ - 84	Lackaw. Steel	62½ - 64⅞
Am. Can com.	45⅝ - 49⅛	Lake Supr. Corp.	17¼ - 17⅞
Am. Can pf.	100½ - 101⅝	Midvale steel	41¼ - 43⅛
Am. Car & F. c.	88½ - 92	Nat.-Acme	30½ - 31
Am. Car & F. pf.	113 - 114½	Nat. En. & S. c.	48 - 50¾
Am. Loco. com.	58 - 60¾	Nat. En. & S. pf.	93 - 94
Am. Loco. pf.	100 - 101¾	N. Y. Air Brake.	102½ - 104⅛
Am. Radiator com.	298	Nova Scotia Steel	55
Am. Steel Fdries.	77⅜ - 85	Pittsbgh. Steel pf.	90½
Bald. Loco. com.	66⅛ - 73½	Pressed Steel c.	62 - 64½
Beth. Steel com.	55½ - 57½	Ry. Steel Spg. c.	69⅞ - 74
Beth. Steel cl. B.	55⅝ - 58⅝	Republic com.	71½ - 72⅞
Case (J. I.) pf.	93½	Sloss com.	49 - 53
Chic. Pneu. Tool.	62½ - 65	Superior Steel	32 - 34½
Colo. Fuel	35 - 36⅝	Transue-Williams	37¼ - 37½
Colo. Fuel pf.	101½	Un. Alloy Steel.	37½ - 37⅞
Cruc. Steel com.	52⅝ - 59	U. S. Pipe com.	14 - 14½
Crucible Steel pf.	91 - 92	U. S. Pipe pf.	42¼ - 43
Deere & Co. pf.	95¼ - 96	U. S. Steel com.	88¾ - 92¾
Gen. Electric	147 - 150	U. S. Steel pf.	114⅝ - 115
Gt. No. Ore cert.	35½ - 38	Va. I., C. & Coke	58
Gulf States Steel.	50⅞ - 59	Warwick	8¼
Int. Har. com.	110⅛ - 114	Westingh. Elec.	40½ - 42⅛

Dividends

The Pittsburgh Steel Co., quarterly, 1¾ per cent on the preferred, payable Feb. 1.

The Taylor-Wharton Iron & Steel Co., regular quarterly, 1¾ per cent on outstanding preferred, payable Feb. 1.

Diagram of Steel Manufacture

With THE IRON AGE of Dec. 5 was published as a supplement a diagram of steel manufacture prepared for the Carnegie Steel Co. by R. B. Woodworth, engineer, showing graphically the various stages in the manufacture of steel. The diagram was so favorably received that all extra copies of the supplement were soon exhausted. For example, the Keystone Steel & Iron Co., Peoria, Ill., wrote: "Twelve people in our office were so impressed with this diagram that they have asked that we write to you for copies if they can be secured." L. P. Featherstone, president Texas Steel Co., Beaumont, Texas, wrote: "This diagram contains information as to the stages of production more clearly than it could be done by a good column editorial on the subject." A. R. Robitzek, Pittsburgh, wrote: "As a student of Duquesne University on the subject of principles of scientific management, I detected at a very opportune time your supplement of Dec. 5 to exhibit to the class just when we were considering the feature of highly integrated forms of business. As the class became very much enthused over the diagram I determined to procure, if possible, enough copies for all."

In order to meet the demand from students and others in the trade and in colleges, a new supply of the supplement has been printed and will be sent to any one on request at the rate of 3c. per copy. Address: Editor, IRON AGE, New York.

May Make Contracts Public

WASHINGTON, Jan. 21—(*By Wire*).—War contractors in every industry are affected by the announcement of the War Department that it has ordered the revocation of the clause or clauses in its contracts prohibiting the publication of information in respect to such contracts. Contractors are therefore authorized and permitted to furnish the public information concerning War Department contracts and orders received by them.

Metal Markets

The Week's Prices

Cents per Pound for Early Delivery

	Copper, New York			Lead		Spelter	
			Tin,				
Jan.	Lake	Electro-lytic	New York	New York	St. Louis	New York	St. Louis
15.....	20.00	20.00	71.50	5.62½	5.37½	7.10	6.75
16.....	20.00	20.00	71.50	5.62½	5.37½	7.10	6.75
17.....	20.00	20.00	71.50	5.62½	5.37½	7.10	6.75
18.....	20.00	20.00	71.50	5.62½	5.37½	7.10	6.75
20.....	20.00	20.00	71.50	5.62½	5.37½	7.10	6.75
21.....	20.00	20.00	71.50	5.50	5.25	7.10	6.75

New York

NEW YORK, Jan. 21.

The markets are inactive with prices tending downward. Copper is selling at 20c. or lower. Practically no business in tin is being done. The leading interest has reduced the price of lead ½c. a lb. There is an over-production of spelter with prices very weak.

Copper.—The copper market is distinctly easy and sales have been made during the past week at 20c. per lb. or lower. It is probable that 19c. or 19.50c. can be done. Copper producers are still quoting 23c., but it is considered doubtful whether they are booking much business on this basis even though they agree to protect customers against their own price declines. Since there is scarcely enough business to keep people busy who are willing to sell at 19.50c. or 20c. the question is raised as to how long the producers will maintain the higher quotation. Cabled reports from England stating that there are about 36,000 tons of copper in that country had a decidedly bearish effect upon the New York market, it being regarded as unlikely that there will be any demand from England for some time to come. France is also believed to have a very large supply of copper bought for war purposes, but not used. During the first two weeks of this year the demand for copper was fairly good, about 10,000,000 to 20,000,000 lb. changing hands. Then the market relaxed into extreme dullness and this condition remained until Monday of this week, when some renewed interest in February shipments was observed.

Tin.—Prices of tin are unchanged, 71.50c. per lb., New York, being quoted. The market is extremely dull. George A. Ormsby of the tin section of the War Trade Board is making efforts to dispose of the allotment of tin bought for this country, but consumers cannot see why they should be called upon to pay 72.50c. per lb. when tin can be imported for about 2c. per lb. less. They regard the obligation of the Government to take this tin as a war measure and believe that the Government should sell at the present market value and accept a loss. Although consumers are not favorable to the Government plan, it is probable that many of them will take the tin from the Government on the ground that it is a patriotic duty to do so. Spot Straits was quoted to-day in London at £250 per ton.

Lead.—Lead is quiet and dull, with a distinctly easier tone. Producers are curtailing output to stabilize the situation. The American Smelting & Refining Co. on Tuesday reduced its price from 6c. to 5.50c., New York. In the outside market quotations of 5.37½c. to 5.50c. are being made, but very little business is being done.

Spelter.—Spelter is weak, production being much greater than the demand. The market is now quoted at 6.75c. to 6.82½c., New York, for Prime Western, and at about 8.50c., St. Louis, for high-grade spelter. The weekly report of the Government on the production and stocks of spelter for the week ended Jan. 11 show that production increased 380 tons and stocks increased 2684 tons.

Antimony.—Antimony is weaker and can be bought in 5-ton lots or larger at 7.50c. to 7.75c. per lb. Smaller lots are quoted at 8.25c. to 8.50c. A 50-ton lot of Chinese antimony was sold on the New York Metal Exchange on Monday and brought 5.95c. in bond, equivalent to about 7c. per lb., duty paid.

Aluminum.—Virgin aluminum has been offered by dealers at 32c. per lb., and it is probable that this price could be shaded. The Government price, which will continue in force until March 1, is 33c. per lb. for 50-ton lots, 33.10c. for 15 to 50-ton lots, and 33.20c. for 1 to 15-ton lots.

Old Metals.—Buying by consumers is for immediate requirements only. The market is quite sluggish. Dealers' selling prices are nominally as follows:

	Cents Per Lb.
Copper, heavy and crucible	20.50
Copper, heavy and wire	19.00
Copper, light and bottoms	16.50
Brass, heavy	13.50
Brass, light	10.50
Heavy machine composition	20.00
No. 1 yellow rod brass turnings	11.00
No. 1 red brass or composition turnings	16.50
Lead, heavy	5.25
Lead, tea	4.00
Zinc	5.50

Chicago

JAN. 21.—There has been but little activity in any of the metals. Copper selling has been confined to second hands, who make a price after negotiation. Buying of tin is of the hand-to-mouth order. Considerable lead was bought on the declining market, but quiet now prevails. There is no movement in spelter, and antimony is quiet again. We quote copper at 22 to 23c. for carloads; tin, 75c. to 77c.; lead, 5.55c.; spelter, 7.25c.; antimony, 8.50c. to 9c. On old metals we quote copper wire, crucible shapes, 15.50c.; copper clips, 15c.; copper bottoms, 14c.; red brass, 15c.; yellow brass, 10c.; lead pipe, 4.25c.; zinc, 4.50c.; pewter, No. 1, 30c.; tinfoil, 35c; and block tin, 45c.

St. Louis

JAN. 20—The non-ferrous markets have been quiet, the close on carlots being: Lead, 5.45c.; spelter, 7.12½c.; and on less than carlots, lead, 6.25c.; spelter, 7.87½c. to 8.25c.; tin, 76c.; copper, 23c., and Asiatic antimony, 9c. per lb. In the Joplin district a slightly better feeling has been apparent, although with no decided increase in prices. Zinc blende, basis 60 per cent, sold at $50 per ton, ranging down to $42.50 for second grades, with the average for the week for the district $45. Calamine was dull, with a range of $30 to $40 per ton, basis 40 per cent, with the average for the week $38. Lead ore was quiet at $60 per ton, basis 80 per cent, with the district average for the week $60 per ton. On miscellaneous scrap metals we quote dealers' buying prices as follows: Light brass, 8c.; heavy red brass, 16c.; heavy yellow brass, 11c.; light copper, 14.50c.; heavy copper and copper wire, 16c.; zinc, 4c.; lead, 5c.; pewter, 40c.; tinfoil, 45c.; tea lead, 4c.; aluminum, 20c.

Fabricated Steel Business in 1918

The bridge and structural shops of the country contracted during the year 1918 for about 1,210,000 tons of steel work, or 56 per cent of their entire shop capacity, according to the records of the Bridge Builders and Structural Society, 50 Church Street, New York, collected by George E. Gifford, its secretary. This compares with 1,285,000 tons in 1917 and 1,500,000 tons each for both 1916 and 1915, and 1,080,000 tons the amount for each year 1914 and 1913.

The new contracts taken on in December, 1918, amounted to about 52,000 tons or 29 per cent of capacity, as compared with 27 per cent in November, 43 per cent in October and 60 per cent in September. The only approach to the present low level of new business was the 29 per cent contracted for in September, 1917, and the slump of the last half of 1914 or before the European buying began.

The Syracuse Smelting Works of Brooklyn, Chicago and Philadelphia will hereafter conduct the sale of their products under the name of the parent company, United American Metals Corporation.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Freight rates from Pittsburgh on finished iron and steel products, including wrought iron and steel pipe, with revisions effective Nov. 1, 1918, in carloads, to points named, per 100 lb., are as follows: New York, 27c.; Philadelphia, 24.5c.; Boston, 30c.; Buffalo, 17c.; Cleveland, 17c.; Cincinnati, 23c.; Indianapolis, 25c.; Chicago, 27c.; St. Louis, 34c.; Kansas City, 59c.; St. Paul, 49½c.; Denver, 99c.; Omaha, 59c.; minimum carload, 36,000 lb. to four last named points; New Orleans, 38.5c.; Birmingham, 57.5c.; Pacific Coast, $1.25; minimum carload, 80,000 lb. To the Pacific Coast the rate on steel bars and structural steel is $1.315, minimum carload 40,000 lb.; and $1.25, minimum carload 50,000 lb. On wrought iron and steel pipe the rate from Pittsburgh to Kansas City is 50c. per 100 lb., minimum carload 46,000 lb.; to Omaha, 50c., minimum carload 46,000 lb.; to St. Paul and Minneapolis, 49.5c., minimum carload 46,000 lb.; Denver, 99c., minimum carload 46,000 lb. A 3 per cent transportation tax applies. On iron and steel items not noted above, rates vary somewhat and are given in detail in the regular railroad tariffs.

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in. angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and zees, structural size, 2.80c.

Wire Products

Wire nails, $3.50 base per keg; galvanized, 1 in. and longer, including large-head barb roofing nails taking an advance over this price of $2, and shorter than 1 in., $2.50. Bright basic wire, $3.35 per 100 lb.; annealed fence wire, Nos. 6 to 9, $3.25; galvanized wire, $3.95; galvanized barb wire and fence staples, $4.35; painted barbed wire, $3.65; polished fence staples, $3.65; cement-coated nails, $3.40 base; these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 58 per cent off list for carload lots, 57 per cent for 1000-rod lots, and 56 per cent off for small lots, f.o.b. Pittsburgh.

Bolts, Nuts and Rivets

Large structural and ship rivets.....$4.40 base
Large boiler rivets.....$4.50
7/16 in. x 6 in. smaller and shorter rivets..
50-10 per cent off list
Machine bolts h.p. nuts, ⅜ in. x 4 in.:
Smaller and shorter, rolled threads....50-10-5 per cent off list
Cut threads.....50-5 per cent off list
Larger and longer sizes.....40-10 per cent off list
Machine bolts, c.p.c. and t. nuts, ⅜ in. x 4 in.:
Smaller and shorter.....40-10 per cent off list
Larger and longer.....35-5 per cent off list
Carriage bolts, ⅜ x 6 in.:
Smaller and shorter, rolled threads.....50-5 per cent off list
Cut threads.....40-10-5 per cent off list
Larger and longer sizes.....40 per cent off list
Lag bolts.....50-10 per cent off list
Plow bolts, Nos. 1, 2, 3.....50 per cent off list
Hot pressed nuts, sq., blank.....2.50c. per lb. off list
Hot pressed nuts, hex., blank.....2.30c. per lb. off list
Hot pressed nuts, sq., tapped.....2.30c. per lb. off list
Hot pressed nuts, hex., tapped.....2.10c. per lb. off list
C.p.c. and t. sq. and hex. nuts, blank....2.25c. per lb. off list
C.p.c. and t. sq. and hex. nuts, tapped....2.00c. per lb. off list
Semi-finished hex. nuts:
⅝ in. and larger.....60-10-10 per cent off list
9/16 in. and smaller.....70-5 per cent off list
Stove bolts.....70-10 per cent off list
Stove bolts.....2½ per cent extra for bulk
Tire bolts.....50-10-5 per cent off list

The above discounts are from present lists now in effect. All prices carry standard extras.

Wire Rods

No. 5 common basic or Bessemer rods to domestic consumers, $57; chain rods, $65; screw, rivet and bolt rods and other rods of that character, $65. Prices on high carbon rods are irregular. They range from $70 to $80, depending on carbons.

Railroad Spikes and Track Bolts

Railroad spikes 9/16 in. x 4½ in. and heavier, per 100 lb., $3.70, in lots of 200 kegs of 200 lb. each, or more; track bolts, $4.90. Boat spikes, $5.05 per 100 lb., f.o.b. Pittsburgh.

Terne Plate

Prices of terne plate are as follows: 8-lb. coating, 200 lb., $14.50 per package; 8-lb. coating, I. C., $14.80; 12-lb. coating, I. C., $16.50; 15-lb. coating, I. C., $17.50; 20-lb. coating, I. C., $18.75; 25-lb. coating, I. C., $20.00; 30-lb. coating, I. C., $21.00; 35-lb. coating, I. C., $22.00; 40-lb. coating, I. C., $23.00 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars at 2.70c. from mill. Refined iron bars, $5.00c.; common iron bars, 3.50c. in carload and larger lots, f.o.b. mill.

Wrought Pipe

The following discounts are to jobbers for carload lots on the Pittsburgh basing card.

Butt Weld

Steel: Inches	Black	Galv.	Iron: Inches	Black	Galv.
⅛, ¼ and ⅜	47	20½	⅛ and ¼	26	+1
½	51	36½	⅜	27	List
¾ to 3	54	40½	½	31	13
			¾ to 1½	36	20

Lap Weld

2	47	34½	1¼	21	6
2½ to 6	50	37½	1½	28	14
7 to 12	47	33½	2	29	15
13 and 14	37½	..	2½ to 6	31	18
15	35	..	7 to 12	28	15

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜	43	25½	⅛, ¼ and ⅜	25	8
½	48	35½	½	30	17
¾ to 1½	52	39½	¾ to 1½	36	21
2 to 3	53	40½			

Lap Weld, extra strong, plain ends

2	45	33½	1¼	22	7
2½ to 4	48	36½	1½	28	14
4½ to 6	47	35½	2	30	17
7 to 8	43	29½	2½ to 4	32	20
9 to 12	38	24½	4½ to 6	31	19
			7 to 8	23	11
			9 to 12	18	6

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variations in weight of 5 per cent.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers have been seven (7) points lower (higher price) than carload lots, and on butt and lap weld galvanized iron pipe have been nine (9) points lower (higher price).

Boiler Tubes

The following are the prices for carload lots, f.o.b. Pittsburgh:

Lap Welded Steel		*Charcoal Iron*	
3½ to 4½ in.	37	3½ to 4½ in.	12½
2½ to 3¼ in.	27	3 to 3¼ in.	+ 2
2¼ in.	20½	2½ to 2¾ in.	+ 4½
1¾ to 2 in.	16	2 to 2¼ in.	+19½
		1¾ to 1⅞ in.	+32

Standard Commercial Seamless—Cold Drawn or Hot Rolled

Per Net Ton		Per Net Ton	
1 in.	$334	1¾ in.	$214
1¼ in.	274	2 to 2½ in.	184
1⅜ in.	264	2¾ to 3¾ in.	174
1½ in.	214	4 in.	194
		4½ to 5 in.	214

These prices do not apply to special specifications for locomotive tubes nor to special specifications for tubes for the Navy Department, which will be subject to special negotiation.

Sheets

Makers' price for mill shipments on sheets of United States standard gage in carload and larger lots are as follows:

Blue Annealed—Bessemer	Cents per lb.
No. 8 and heavier	3.85
Nos. 9 and 10 (base)	3.90
Nos. 11 and 12	3.95
Nos. 13 and 14	4.00
Nos. 15 and 16	4.10
Box Annealed, One Pass Cold Rolled—Bessemer	
Nos. 17 to 21	4.50
Nos. 22 and 24	4.55
Nos. 25 and 26	4.60
No. 27	4.65
No. 28 (base)	4.70
No. 29	4.80
No. 30	4.90
Galvanized Black Sheet Gage—Bessemer	
Nos. 10 and 11	5.05
Nos. 12 and 14	5.15
Nos. 15 and 16	5.30
Nos. 17 to 21	5.45
Nos. 22 and 24	5.60
Nos. 25 and 26	5.75
No. 27	5.90
No. 28 (base)	6.05
No. 29	6.30
No. 30	6.55
Tin-Mill Black Plate—Bessemer	
Nos. 15 and 16	4.50
Nos. 17 to 21	4.55
Nos. 22 to 24	4.60
Nos. 25 and 27	4.65
No. 28 (base)	4.70
No. 29	4.75
No. 30	4.75
Nos. 30½ and 31	4.80

PERSONAL

On Friday evening, Jan. 17, the immediate business associates of E. W. Pargny, president American Sheet & Tin Plate Co., tendered him a testimonial dinner in honor of the tenth anniversary of his presidency of the American Sheet & Tin Plate Co. The dinner was attended by those who have come in personal contact in a business way with Mr. Pargny, there being seated at the table twenty-five or more men who had been associated with him for ten years or more, some from fifteen to twenty years and others for twenty-five to thirty years. S. A. Davis, vice-president of the company, acted as toastmaster. George P. Early, special agent of the company, in behalf of those present, presented Mr. Pargny with a silver vase, suitably inscribed and containing ten American beauty roses. It is just about ten years ago that the American Sheet Steel Co. and the American Tin Plate Co. were consolidated under the present name of American Sheet & Tin Plate Co. and the offices and operating departments moved from New York to the Frick Building, Pittsburgh, where they have been located for that period. Mr. Pargny has been connected with the sheet and tin plate trade for over 30 years.

E. W. PARGNY

Robert M. Hutchison, of the Bethlehem Steel Co., has been appointed assistant superintendent of blast furnaces at the Sparrows Point, Md., works. For a number of years he has been general foreman of the blast furnace department at the Steelton, Pa., plant, and will be succeeded in this position by Paul R. Nolding.

William Bangser, Bethlehem, Pa., has been appointed superintendent of the Steel Treatment Department of the Bethlehem Steel Co., to succeed Robert M. Bird, rcently appointed metallurgist.

J. Leonard Replogle has been elected chairman of the board and a director of the Wharton Steel Co., Dover, N. J. He succeeds C. B. Ellis on the directorate.

Lewis D. McClaren, who has served the United States Navy Department since war was declared in the capacity of metallurgist and chief of steel production and inspection, Chicago district, will resign Feb. 1 to become connected with the Chicago office of Rogers, Brown & Co., as sales representative.

L. P. Prossen has resigned as mechanical superintendent of the Black & White Taxicab Co., New York, to become associated with the Nilson-Miller Co., Hoboken, N. J., to which he has been elected vice-president, in charge of the gear-cutting and piston ring departments.

D. R. Black has been made district sales manager of the Central Iron & Steel Co., of Harrisburg, Pa., having charge of the southern territory, with offices in the Continental Building, Baltimore. Mr. Black was formerly with the Illinois Steel Co., Chicago, but for the past year and a half has been connected with the sub-committee on steel distribution, American Iron and Steel Institute, Washington.

Major N. C. Walpole, of the Ordnance Division, who was granted leave of absence for the duration of the war by the Niles-Bement-Pond Co. and Pratt & Whitney Co., has received an honorable discharge from the service and returned to his duties as Southern sales manager of the above-named companies, with head office at 2015 First Avenue, Birmingham, Ala.

William Cairns, general manager of the Detroit Pressed Steel Co., Detroit, and widely known among automobile parts producers, has retired from active connection with the company and has gone to Florida.

Thomas L. Briggs, former assistant to the vice-president and advertising manager Remington Arms Co., Woolworth Building, New York, has resigned to accept the presidency of *Collier's Weekly*.

F. E. Norris, formerly superintendent of the Carnegie Steel Co. plants at Sharon, Pa., and Farrell, Pa., recently returned from France, where he was supervising the erection of a steel works at Lyons. He is in this country to place contracts for material and intends to return to France.

John Purpie, formerly connected with the New York office of the Standard Car Construction Co., has been made general manager of the plant at Masury, Ohio, vice C. K. Strasbaugh, resigned. The latter was formerly identified with the Pennsylvania Tank Car Co., and intends to take a needed rest.

Oscar P. Berg, for eight years register of deeds of Muskegon county, Mich., has become manager of the Advance Brass Mfg. Co., Muskegon, Mich.

John Q. Ross, secretary of the Linderman Steel & Machine Co., Muskegon, Mich., and one of its directors, has bought a controlling interest in the West Michigan Steel Foundry Co., and has been elected president. He succeeded William F. Jeannot, who was elected chairman of the board of directors and remains treasurer. A. Show, who was vice-president and general manager, retires from the company.

Robert M. Kilgore, for 11 years district sales manager in the Cleveland district of the Jones & Laughlin Steel Co., Pittsburgh, has been named assistant manager of sales of the hot-rolled division of the company at Pittsburgh, effective from Jan. 20, his headquarters to be in the general offices at Pittsburgh. He will be succeeded at Cleveland by E. A. France, who has been assistant district manager at Cleveland under Mr. Kilgore for some years.

A. A. Straub, general manager of the Connellsville, Pa., offices of the Superb Coal & Coke Co., has been transferred to the Pittsburgh office of that company.

Horace N. Trumbull, formerly advertising manager of the S K F Ball Bearing Co., Hartford, Conn., has been appointed advertising manager of the Wellman-Seaver-Morgan Co., Cleveland. He has recently received his discharge from the Engineer Officers' Training School at Camp Humphries, Va.

Paul B. Morgan, president Morgan Construction Co., Worcester, Mass., and Jerome R. George, vice-president, have arrived in England for a business trip of six weeks or more through Europe.

E. C. Mayo, Worcester Pressed Steel Co., Worcester, Mass., will read a paper on "The Responsibilities of the Credit Man to His House, Its Customers and Himself," at the conference of New England Credit Men, to be held in Providence, R. I., Feb. 6.

Marcus A. Coolidge, president Fitchburg Machine Works, Fitchburg, Mass., is now in France investigating industrial and trade conditions.

A. W. Russel has again taken up active duties as president of the Russel Motor Axle Co., of Detroit, having been for the past year and a half in Washington as chairman of the axle division of the Standardized Truck conference, and later as assistant to the assistant secretary of war.

J. L. Jacobs, who has been engaged on special staff work for the United States Shipping Board Emergency Fleet Corporation, has returned to J. L. Jacobs & Co., industrial engineers, Chicago.

Samuel Fogelman, who was formerly connected as president and general manager with the Wayne Scrap Iron & Metal Co., Detroit, has embarked in business under the name of Samuel Fogelman & Co., with offices at 701 Real Estate Exchange Building, Detroit.

W. W. Clements, ensign, aviation section, construction corps, United States Navy, has been released from active duty and has returned to the Industrial Works, Bay City, Mich., where he has taken up the duties of assistant to the president. Lieut. James Shearer, engineers, United States Army, has received his honorable discharge and has opened an office for the Industrial Works in the McCormick Building, Chicago, where he will be in charge of sales for the Chicago district.

Frank Davies Hennen Building, New Orleans, has been appointed Southern sales manager of the Central Frog & Switch Co., Cincinnati. Mr. Davies, who is also a representative of the Vulcan Iron Works, of Wilkes-Barre, Pa., has been in the railroad supply and equipment business over 25 years in the South and in Latin-America.

Frank H. Sleeper, president Sleeper & Hartley, Inc., Worcester, Mass., is spending the winter in St. Petersburg, Fla.

W. S. Pfeifer has been appointed district manager of the Boston office of the Allen-Bradley Co., located at 201 Devonshire Street, Room 308. Mr. Pfeifer was assistant chief engineer of the above company. H. C. Boswell has been appointed district manager for the Philadelphia territory. Mr. Boswell had charge of the Boston district before going to Philadelphia. The Philadelphia office of the above company is located at 1710 Finance Building.

A. A. Heller, treasurer and general manager of the International Oxygen Co., has given up his active managerial duties. Eugene Schoen has been appointed general manager for the company. Mr. Heller, as treasurer, continues in charge of the financial departments of the business.

Glenn L. Orr, well known in Detroit automobile circles, who has been connected with the Briscoe Motor Corporation, of Jackson, for the past two years, as purchasing agent, resigned Jan. 1 to become secretary of the M. H. Herrmann interests of Detroit. F. W. Wedow has been appointed purchasing agent to succeed him.

A. W. Dietzel, formerly superintendent of the Waukesha Motor Co., is now associated with the Moline Plow Co., tractor department, Rock Island, Ill.

C. Raymond Messinger, vice-president and general manager Chain Belt Co., Milwaukee, is making plans to go to Europe early in February for the purpose of re-establishing export connections for his company in England and France. The company, prior to the outbreak of the war, conducted branches in London and Paris.

Edward A. Niven has been appointed sales agent for the Buffalo district of the American Steel & Wire Co., succeeding Allan Fraser. Mr. Niven assumed the duties of the office Jan. 1, with headquarters at 337 Washington Street. He was formerly traveling representative of the company in New England.

Herbert W. Gledhill, formerly sales engineer in the Philadelphia office of the Shepard Electric Crane & Hoist Co., Mantour Falls, N. Y., has been made district manager of that office, with Messrs. Glenn Rumsey and Leland Woodworth as assistants.

The Inland Steel Co. has opened offices at Kansas City, in the Commerce Building, in charge of Oscar H. Bourscheidt, and at Detroit, in the Ford Building, in charge of Peter M. Lorenz. Both district managers are young men who have grown up in the company and are thus being advanced.

Lewis Russell, who has been manager of the plant section, New York district ordnance office, U. S. A., has returned to his duties as president of Russell, Holbrook & Henderson, Inc., machine tools, 30 Church Street, New York. S. R. Warner, who has been in charge of gage production in the plant section, New York district ordnance office, is now connected with the sales department of Russell, Holbrook & Henderson.

George A. Prendergast has been appointed district sales manager for the Lackawanna Steel Co., with offices at 2 Rector Street, New York. He succeeds H. H. Barbour, who has resigned to become vice-president of the Consolidated Steel Corporation.

J. Arthur Deakin, formerly representative in this country for H. W. Ward & Co., Bimingham, England, has entered the service of E. Isbecque & Co. as New York manager. E. G. Todd, the partner of E. Isbecque & Co., who has been managing the office during the war, will shortly return to Europe to resume the direction of the machine tool and small tool departments in their Brussels and Antwerp offices.

Carleton A. Chase, president Syracuse Chilled Plow Co., Syracuse, N. Y., has been appointed by the Governor of New York a member of the reconstruction committee which is to study the post-war problems facing the State. The committee comprises 36 members, who will serve without compensation. They are to look into housing, taxation, food problems, employment, public health, and the speeding up of public works, among other things.

W. H. Waddington, for some years associated with the Bethlehem Steel Co., has been appointed district manager of the New York branch of Wheelock, Lovejoy & Co., Inc.

John S. Kennedy is now associated with the Matlack Coal & Iron Corporation, and has charge of the Philadelphia office in the Pennsylvania Building.

Edward L. Leeds, general sales manager Niles-Bement-Pond Co., New York, W. M. McFarland, manager marine department Babcock & Wilcox Co., and B. B. Thayer, Anaconda Copper Mining Co., have been nominated to serve as trustees for the Engineers' Club of New York.

Clarence W. Howard, president Commonwealth Steel Co., St. Louis, has been appointed chairman of the committee which will handle the details for the convention of the National Society for Vocational Education, to be held at the Hotel Statler, in St. Louis, Feb. 21 to 23 inclusive.

George M. Brown, president Certain-teed Products Corporation, St. Louis, has been elected a director of the Wagner Electric Mfg. Co., succeeding J. M. Buick, who has moved to New York.

Lieut. George C. Varnum, who left the post of assistant superintendent of safety of the Commonwealth Steel Company, St. Louis, to command a machine gun company, has returned to the company in his former capacity.

R. Netzeband has been placed in charge of the newly created safety department of the steel works of the National Enameling & Stamping Co., Granite City, Ill.

L. V. Rockwell, for seven years vice-president and general manager of the Miller F. Wilfong Iron Works Co., has severed this connection to become vice-president and general manager of sales of the Thomas D. Prosser Co., Schmulbach building, Wheeling, W. Va., dealer in pig iron, coke and billets.

Robert S. Maddocks, son of Robert H. Maddocks, district sales manager in New York for the Central Iron & Steel Co., Harrisburg, Pa., has been appointed assistant secretary of the Smiley Steel Co., 111 Broadway, New York.

Reducing Output Sharply

At a meeting of directors of the Crucible Steel Co. of America, held in its general offices, Pittsburgh, on Thursday, Jan. 16, the question of declaring a dividend on the common stock received no serious consideration. It developed that owing to the many cancellations of Government contracts, and the few new orders coming in, the company has closed down its Norwalk, Ohio, plant for an indefinite period. The Pittsburgh Crucible Steel Co., a subsidiary, is operating only five of its 12 open-hearth furnaces at Midland, Pa. The directors also decided to close another large plant at once and at present this company is not operating to more than 60 per cent of capacity. The company states that unless demand for this production soon improves it may have to close several other of its plants and lay off a great many men.

OBITUARY

Rolla C. Carpenter

Rolla C. Carpenter died at his home in Ithaca, N. Y., Jan. 19. He would have been 67 years old on June 26. An engineer and educator, to whom many of the successful men of industry owe their inspiration, Professor Carpenter has through them and as the result of his own indefatigable labors left a deep impression on mechanical engineering developments in this country.

ROLLA C. CARPENTER

Attaining early in his career an enviable reputation as an engineering expert, he was always the center of a large group who sought his advice or were desirous of studying under his direction. Besides a kindliness of personality which of itself drew a large following, he was conspicuous for the prominent position he reached in a number of diverse specialties in mechanical engineering, and in a word he achieved the remarkable position of being regarded as an expert in a number rather than in only one, two or even three particular directions. The result was that his contributions to engineering literature, which were quite voluminous, were always received by a large audience, which had come to look without disappointment on receiving fresh supplies of data as differentiated from opinion. An authority throughout his active career, he was sought after as an expert in patent and other litigations.

He was professor of experimental engineering at Cornell University from 1895. Almost from his earliest days in this capacity he stood apart from most of the teaching staff of Sibley College of that University, as well as other technical schools, in that he was widely regarded as having a close contact with outside affairs, and his instruction on the theory of engineering was therefore tempered by the practical conditions of the industrial world. Successively he gained authoritative positions in the field of the steam engine, in heating and ventilation, in cement manufacture and in the automobile field. And in all cases he contributed papers to the societies devoted to these branches of engineering, incorporating much of the experimental information he gathered through his private commercial tests and through the work of engineering students. Besides these numerous papers, he was the author of books which have remained as standard authorities and as text books, including his "Experimental Engineering," "Heating and Ventilation" and "The Gas Engine." The list of technical societies of which he was a member is long and includes the national societies of civil engineering, mechanical engineering, mining engineering, heating and ventilating engineering, refrigerating engineering and automotive engineering, and he was a member of the American Society for Testing Materials and a member of the Engineers' Club of New York.

He was graduated from the University of Michigan in 1875, and after a brief experience in railroad construction on a branch of the Michigan Central he joined the instruction staff of the Michigan State Agricultural College, where he began his heating engineering in designing the central station heating plant for that institution. He served as an engineer for New York for the high pressure fire pumping plant in that city in 1911 and designed the high pressure fire fighting system for Baltimore. He was judge of machinery and transportation at the Chicago Exposition in 1893, and was a judge also at the Pan-American Exposition, Buffalo, 1901, and at the Jamestown Exposition in 1907.

WALTER V. TURNER, manager of engineering of the Westinghouse Air Brake Co., a leading mechanical engineer of this country, and an inventor of international prominence, died Jan. 9 at the Columbia Hospital, Wilkinsburg, Pa., after an illness of about eight weeks, aged 53 years. In 1903, after he had been for several years general airbrake inspector for the Santa Fé system, he began his connection with the Westinghouse Air Brake Co. as an engineer, and he remained with that company and associate interests until his death. As a reward for his achievements as an inventor in the development of the air brake he was the holder of the Elliott Cresson and the Edward Longstreth medals from the Franklin Institute of Philadelphia. He was made a Doctor of Engineering by the University of Pittsburgh. The Air Brake Association of America, at its convention at Richmond Va., 1912, passed a resolution expressing its recognition of him as the leading air brake expert.

GEORGE SHERWOOD HODGINS, editor of *Railway and Locomotive Engineering*, with which he has been connected for fifteen years, died Jan. 18 of pneumonia at his home, 390 Wadsworth Avenue, New York, at the age of 59 years. He was born in Toronto, Canada, and was for a number of years mechanical engineer for the Canadian Pacific Railroad. He was a member of the American Society of Mechanical Engineers.

WILLIAM CHARLES BRUCE, president Bowler Foundry Co., Cleveland, died Jan. 16, aged 60 years, after an illness of several years. He had long been identified with the foundry industry in Cleveland and was formerly president of the Bruce-Macbeth Engine Co., the Union Steel Screw Co. and vice-president of the W. W. Sly Mfg. Co.

JULIUS E. WATEROUS, a pioneer among Brantford, Ont., industrial builders, passed away in the city, Jan. 11. The deceased was in his 75th year. He was vice-president of the Waterous Engine Works Co., for many years, and the founder of the Waterous Wire Nail Works.

WILLIAM H. MILLER, president W. H. Miller Mill & Mine Supply Co., Columbus, Ohio, died at his home in that city, Jan. 10, aged 70 years. He was formerly superintendent of motive power of the Hocking Valley Railroad Co., and later held the same position with the Chicago & Eastern Illinois Railroad.

Lieutenant JOHN C. VAN RIPER, JR., who before his enlistment in the army was secretary and manager of the Banner Stove Works, St. Louis, died of pneumonia after six months' service in France, according to word just received by his wife.

FRANCIS J. TORRANCE, vice-president of the Standard Sanitary Mfg. Co., Pittsburgh, died at his home in that city on Jan. 8. He was a trustee of the Western Pennsylvania Classical and Scientific Institute and Bucknell University.

ARTHUR H. WENDELCKE, Brooklyn, N. Y., for some years head of the financial department of J. H. Williams & Co., of that city, manufacturers of drop forgings, died of pneumonia on Jan. 12.

H. G. FERGUSON, auditor of the Gulf States Steel Co., Birmingham, Ala., since 1907, died January 11 of a complication following influenza. He was 45 years of age.

FRED W. TUSHER, for 20 years a traveling salesman connected with the Chicago warehouse of P. & F. Corbin, died at his home in Chicago, Jan. 13, aged 51 years.

PIG IRON ASSOCIATIONS

Meetings Held at Pittsburgh Consider Conditions in the Trade

On Wednesday, Jan. 15, a meeting of the Associated Manufacturers of Merchant Pig Iron, operating merchant blast furnaces throughout the country, who sell their pig iron in the open market, was held in the William Penn Hotel, Pittsburgh. The attendance was large, blast furnace operators from nearly all parts of the country being present. The chief question to be decided at the meeting was whether the association should be continued, it having been formed largely as a war measure, and to better serve the interests of the merchant blast furnaces during the war period. E. N. Rich of Baltimore, president of the Alabama Co., Birmingham, Ala., presided, and John A. Penton, *Iron Trade Review*, was secretary. After a discussion it was decided to continue the organization and it was also decided to inaugurate in the future, if possible, a uniform system of quoting prices on pig iron, based on chemical content, instead of fracture; in other words, the suggestion of the Government that the standard of foundry iron be No. 2, silicon 1.75 to 2.25 per cent, No. 1 to be 2.25 to 2.75 and No. 3, 1 to 1.75 per cent. It was also decided to ask the trade papers to quote prices on the above basis. It is doubtful, however, now that the pig iron market is open, whether the extras charged for high silicon irons over the base price of No. 2 foundry will be maintained. An election of officers was held and resulted as follows: H. G. Dalton, Pickands, Mather & Co., Cleveland, president; C. D. Dyer, Shenango Furnace Co., Pittsburgh, vice-president; Col. F. B. Richards, M. A. Hanna & Co., Cleveland, treasurer, and John A. Penton, managing editor, *Iron Trade Review*, Cleveland, secretary.

In the afternoon the annual meeting of the American Pig Iron Association was held, C. D. Dyer, Shenango Furnace Co., Pittsburgh, being in the chair, and John A. Penton was secretary. The report of operations of this association for the year was read, and was said to be very satisfactory. An election of officers was held and resulted as follows: Theodore W. Friend, secretary and treasurer of the Clinton Iron & Steel Co., Pittsburgh, president; Col. F. B. Richards, M. A. Hanna & Co., Cleveland, treasurer, and John A. Penton, *Iron Trade Review*, Cleveland, secretary.

It was the sense of the pig iron manufacturers present at these meetings that the pig iron trade was in a transition period from high to lower prices. The present demand for pig iron is quiet, nearly all consumers still having iron due them on old contracts, mostly at prices higher than are now quoted, and these are going through a period of adjustment. It was the feeling of the pig iron manufacturers present that when the market had reached a proper level in price at which consumers will be interested, demand would very materially improve. It is likely there will be a very large falling off in output of pig iron in the next three or four months, as many furnaces are taking advantage of the quiet period to blow out for relining and other repairs. Makers of pig iron are averse to piling iron at present high costs. The fact that the Fuel Administration will remove all restrictions on Feb. 1 on prices of coke leads to the belief that probably pig iron manufacturers will be able to obtain coke later on at prices lower than are ruling now.

The Buffalo Forge Co.'s salesmen's convention held Dec. 11, 12 and 13 at the Hotel Statler, Buffalo, was the beginning of a series of conventions of this type which will be held at intervals. The salesmen had an opportunity of visiting the plants of the Buffalo Forge Co. and Steam Pump Co. Among the subjects discussed were Cancellations, Advertising, Meeting Competition, Selling to Engineers, Architects, etc., Air Washers and Humidity Controls.

The Woodstock furnace at Anniston, Ala., which has been out of blast since the middle of November for relining and repairs, is now ready to be blown in.

NO WAGE CUTS

Youngstown Companies Issue Statement—Shipments Much Below Normal

YOUNGSTOWN, OHIO, Jan. 21.—(*By Wire.*)—Refuting propaganda circulated by socialistic labor organizers, steel executives today issued a statement that no wage cuts would be made for at least six months, not until the 1919 food crop is available and living costs are lowered. More intermittent operations are looked for in the next two months, and some general shutdowns are possible.

Pipe and sheets are in better demand in the district than any other class of steel products, finished or semi-finished. Tin plate buying is also picking up, but no general buying movement is yet in sight.

The Trumbull Steel Co., Warren, Ohio, is converting a number of tin mills into sheet mills. Export business is still light. Buyers are evidently waiting to be satsfied that no further price recessions will take place.

Most corporations in the Mahoning Valley report shipments are only 60 per cent of normal. Output is being stocked wherever possible to keep plants operating. Practically no business is being placed by jobbers to replenish depleted stocks. Many small orders are being received, but only against immediate needs. Orders for less than carload lots are frequent.

Conspiracy to Defraud Charged

ST. LOUIS, Jan. 21.—(*By Wire.*)—John Flammang, president, and Ottmar G. Stark, vice-president and general manager, Inland Machine Tool Works, St. Louis, were arrested to-day on warrants charging conspiracy to defraud the Government by falsifying records as to munitions production, at the Federal District Attorney's office. The amount involved is said to be $75,000. A search warrant was issued directing the seizure of all books of account, cost sheets, check books, payrolls, ledgers, memoranda and correspondence with Government officials and with the Wagner Electric Co. According to Government officials, the Inland company received sub-contracts from the Wagner Electric Co. It is alleged officials of the company changed records, making false reports of cost of production. Mr. Flammang said he did not know sub-contracts from the Wagner Company were Government work. Both pleaded not guilty, and were released on $5,000 bonds each. The Inland company manufactures piston rings.

Following the arrests, the Government official said the Wagner Electric Co. was in no way a partner to any irregularity. Statements of the Inland Machine Works as to the expense of filling contracts were presented to the Wagner company, which certified them to the Government for payment. The Government remitted to the Wagner company, which in turn remitted to holders of subcontracts.

Strikes in New England

Strikes, old and new, continue to have their irritating aftermath for all concerned. Complaints submitted by molders against 73 companies in the Boston district met with a rebuff from the War Labor Board, Jan. 18, in that the request for the establishment of an 8-hr. day in the foundry industry was dismissed.

At Pittsfield, Mass., the 1777 striking employees from the local plant of the General Electric Co. are learning that according to competent authority the estimated cost of the strike has been from $250,000 to $300,000 for the employees and from $500,000 to $750,000 for the company.

At the annual meeting of the Society of Automotive Engineers, 29 West Thirty-ninth Street, New York, Feb. 4-6, the standards committee will submit to the society, among other things, recommendations covering ball and roller bearings, roller chains for power transmission, nuts for machine screws, springs, flexible metal tubing for oil and gas connections and specifications on steel castings.

Machinery Markets and News of the Works

PLAN SALE OF WAR TOOLS

Industry and War Department Reach Agreement

Builders Will Probably Take Over Tools—Fair Export Demand Is Developing

As announced more fully elsewhere in this issue, the machine-tool industry and representatives of the Government have agreed upon a plan for the disposition of the large numbers of machine tools bought for war work but not used. A joint committee of the National Machine Tool Builders' Association and the National Supply and Machinery Dealers' Association conducted negotiations with C. W. Hare, director of sales for the War Department, and Lieut.-Col. A. La Mar and G. E. Merryweather, also acting for the War Department.

The original estimate as to the quantity of surplus standard tools which the Government will have to sell has been very considerably reduced, it is announced. This estimate ranged from $200,000,000 to $300,000,000. It is expected that the industries of the country will be able to absorb these surplus Government-owned tools within a reasonable time, so as not to seriously disarrange business.

An approximate inventory of the tools will be taken soon, and lists will be submitted to each manufacturer whose tools are represented, so that he may have the opportunity of presenting a proposition to the War Department covering the machines of his own make under which he could repurchase these machines at mutually satisfactory prices and terms. If this plan fails, an arrangement will be considered under which each maker will market the Government machines in such a manner as will permit the reasonable operation of the machine-tool industry and a reasonable employment of its labor. If both of these plans should fail, the War Department will proceed to market the tools in such manner as it sees fit.

Export sales are the most promising feature of current machine-tool business. While this trade is by no means of large proportions, it is developing very satisfactorily, especially for those companies which have established agencies abroad. An English company last week placed an order for about 100 machines.

Domestic buyers are in a waiting attitude. They are principally dissatisfied with the price situation, many of them failing to understand why "war-time prices," as they call them, should continue to prevail.

In the New York market there has been a fair demand from the Navy Department and from shops working on brass goods, such as valves, injectors, plumbing goods, etc.

The Chicago market notes a demand that is quite active considering present conditions. The Chicago Pneumatic Tool Co. was a fairly large buyer last week. The Moline Plow Co. also bought a number of tools, as did a manufacturer of washing machines.

In Cleveland the demand, though not large, is fair, and is confined principally to manufacturers of automobiles, tractors and farm implements.

New York

New York, Jan. 21.

Although there was a fair volume of machine-tool buying during the first two weeks of the new year, the past week has been extremely quiet, with few orders being booked. There have been sales of single tools, but there has been nothing like the amount of buying that was expected from the considerable number of inquiries that were received about the first of the year. Quotations have been made on these inquiries, but the general decision of prospective purchasers is to take no action for the present. Doubtless this attitude on the part of machine-tool users is due to an expectation of lower prices, which have not materialized except in a few scattered instances, wherein reductions have been made by builders whose prices were higher than those quoted by competitors on similar types of machines.

In foreign business there is a little more activity, the representative for a British house having placed orders last week for about 100 machines for stock. It is understood that on these sales the machine-tool builders protected their British agent against declines in prices within a reasonable period. Those who are in close touch with the reconstruction program in France and Belgium predict that it will be a few months, at least, and in some instances longer before much business can be expected for the rehabilitation of manufacturing plants in the devastated areas.

It is predicted that British machine-tool builders may invade the American market when conditions become more suitable. A large English concern which manufactures about 20 types of tools is considering invasion of this field, but under present conditions of high manufacturing costs in England probably will not do anything for the present.

Very few offerings of second-hand machine tools have been made in this market as the result of cancellations of war contracts, but it is expected that, as inventories have been completed, there will soon be considerable used equipment offered. The Rollys-Royce Co., which had installed tools for airplane work in the plants of the H. H. Franklin Mfg. Co., Syracuse, N. Y., and the F. B. Stearns Co., Cleveland, has asked second-hand dealers to bid on this equipment. In the appraisal of the equipment in a Philadelphia war plant which is to be sold, a valuation was arrived at by the appraisers which approximated 25 per cent of the cost of the new tools.

The principal buying of new machine tools at present is being done by the Navy Department, which is proceeding with work at various navy yards without interruption. Manufacturers of brass goods, such as valves and injectors, plumbing goods, etc., are fairly busy, and are buying in a small way.

Plans have been announced for the construction of a new torpedo station by the Navy Department at Alexandria, Va., work on which is to be begun in the spring.

Despite the lack of an active machine-tool demand, manufacturers are busy, both on old orders and in creating reserve stocks for future business. The confidence of machine-tool builders in the ultimate return of good business conditions is indicated by the fact that some of them are building a great many machines for stock.

Crane business is exceedingly dull, and some plants have work enough only for about two months' operation. There is said to be great disparity in prices quoted on recent jobs. The successful bidder on one job is said to have quoted a price which another crane builder figured to be below its own costs. The bids received by the Navy Department for about 20 cranes for the Mare Island Navy Yard have been rejected, and new bids will probably be called for. The Union Shipbuilding Co., Baltimore, affiliated with the McClintic-Marshall Co., Pittsburgh, is reported to have placed an order for three cranes. The Oltmer Iron Works, Hoboken, N. J., has bought a 5-ton and a 7½-ton crane from the Pawling & Harnischfeger Co. An order for two cranes for the Brooklyn Navy Yard has gone to the Bedford Foundry & Machine Co. Westinghouse Church Kerr & Co., New York, are in the market for a 10-ton grab-bucket crane, 77 ft. span, for a Chicago plant.

The American Shell Co., 350 Twenty-first Avenue, Paterson, N. J., is gradually reducing its working force. It is

understood that the plant will operate at its present schedule for a month to come, when it is expected that orders placed during the war will near completion. A. W. Kolbert is production manager.

George Mack, Atlantic City, N. J., is planning the erection of a one-story machine shop, 50 x 100 ft., to cost $10,000.

The Board of Freeholders, New Brunswick, N. J., is having plans prepared for a one and two-story vocational school, 35 x 100 ft., on Easton Avenue, to cost $65,000. A mechanical department will be provided, equipped with machinery. Alexander Merchant, 363 George Street, is the architect.

The Tippett & Wood Co., Phillipsburg, N. J., manufacturer of boilers, tanks, etc., has reduced its working force by about 50 men. While the boiler plant has been practically closed down the past week the company is understood to be planning for a resumption of operations.

The Ordnance Department, Washington, has ordered a suspension of further construction work at the shell loading plants of the Bethlehem Steel Co., Belcoville, N. J., and the Atlantic Loading Co., an interest of the Electric Bond & Share Co., New York, at Amatol, N. J. Construction work at the two plants up to the present time aggregates about $5,000,000. Shell loading operations will continue for the present with a reduced working force.

George E. Blakeslee, Inc., Jersey City, N. J., has been incorporated with a capital of $500,000 by George E. Blakeslee, Marshall Van Winkle and Francis V. Many to manufacture machinery.

The Alloy Welding Products Co., Jersey City, N. J., has been incorporated with a capital of $10,000 by Joseph J. Hughes, Charles A. McCune, New York, and Thomas G. Gallagher, Jersey City, to manufacture brass and copper specialties.

The Manufacturers' Oxygen Co., Jersey City, N. J., has been incorporaed with a capital of $50,000 by Benjamin Tracey, John Milton and John L. Ridley to manufacture industrial oxygen, etc.

The Roberts Tool Co., Newark, N. J., has recently removed its entire works from 391 Mulberry Street to 89 Colt Street, Irvington.

Fire at the plant of Martin R. Everett, Inc., Emmet Street and Avenue D, Newark, N. J., manufacturer of structural steel, damaged equipment in the crane building, a structure 150 x 200 ft.

The General Tube Co., Newark, N. J., has been incorporated with a capital of $50,000 by David and Isador Leesenbaum to manufacture metal tubing.

The Cohoes Power & Light Corporation, Poughkeepsie, N. Y., has issued bonds for $2,500,000 to be used in part for extensions and improvements.

The Maxim Electrical Corporation, New York, has been incorporated with a capital of $25,000 by F. F. Buttner, S. M. Lnopf and J. Harris, 1547 Broadway, to manufacture electrical products.

The New York Edison Co., Irving Place and Fifteenth Street, New York, is considering the construction of a large electric power plant on property recently purchased at the foot of East 133d and 134th streets and the East River, valued at about $350,000. The proposed plant, it is understood, will be used to furnish electric energy to the Port Morris section of the Bronx.

Charles A. Roos, operating a coppersmith works at 429 East Ninety-first Street, New York, has organized and incorporated a company to be known as Charles A. Roos, Inc., to manufacture brass and copper products. J. M. Ruck, 420 West Forty-eighth Street, is an incorporator.

The Patten Typewriter Corporation, New York, has been incorporated with a capital of $100,000 by W. and J. and O. Patten, 53 West 125th Street to manufacture typewriters.

The Morse Dry Dock & Repair Co., foot of Fifty-sixth Street, Brooklyn, N. Y., through its president, E. P. Morse, has denied the recent report that negotiations are under way for the sale of its plant.

N. P. Nelson, operating an iron works at 252 Fortieth Street, Brooklyn, N. Y., has incorporated the N. P. Nelson Iron Works with capital of $25,000 to manufacture iron and steel products.

A one-story boiler plant will be erected at the Bronx Hospital, New York, at Fulton Avenue and 169th Street. Dr. Alexander Goldman is president.

The Louden Machinery Co., Albany, N. Y., has been incorporated with a capital of $10,000 by R. B. Louden, C. M. Houck and O. B. Stichter to manufacture farm machinery and tools.

The Aetna Machine Shop, New York, has been incorporated with a capital of $10,000 by H. A. Richard, T. F. Peterson and M. H. Sooley, 317 West 119th Street to operate a general machine works.

A one-story brick and steel boiler plant, 50 x 55 ft., to cost $50,000, will be erected by Julius Kayser & Co., 45 East Seventeenth Street, New York, at their factory on Classon Avenue. W. L. Fleisher & Co., 31 Union Square, New York, are the engineers.

The Sanitary Phone Co., New York, has been incorporated with a capital of $50,000 by B. D. Colen, M. L. Abbott and V. H. Emerson, 433 Riverside Drive, to manufacture telephone equipments.

The Newberth Products Co., New York, has been incorporated with a capital of $100,000 by A. Hirsch, H. S. Hartstein and C. A. Waldon, 35 Nassau Street, to manufacture metal tubing, etc.

The Simplex Automobile, 755 Fifth Avenue, New York, is considering plans for extensions in its two-story plant on Twelfth Street, Long Island City.

The I. A. M. Alarm & Seal Lock Co., New York, has been incorporated with a capital of $50,000 by J. Forbes, T. M. Clare and T. J. Brennan, 104 Perry Street, to manufacture lock specialties.

The Standard Concrete Steel Co., 105 West Fortieth Street, New York, has filed plans for a three-story plant, 100 x 175 ft., on West Sixty-first Street, near Amsterdam Avenue, to cost about $200,000. A portion will be used as a machine shop.

The Elliott Book-Typewriter Co., Brooklyn, N. Y., has been incorporated with a capital of $200,000 by C. Elliott, F. H. Butehorn and R. W. W. Vandervoort, 9 Agate Court, to manufacture typewriting machines.

The Franklin Machine & Steam Boiler Works, 88 Quay Street, Brooklyn, N. Y., have had plans prepared for extensions in its one-story works on Franklin Street.

The Marine Electric Co., New York, has been incorporated with a capital of $30,000 by O. E. Miller, W. H. Scott and R. Elkan, 15 Whitehall Street, to manufacture electrical products.

The Roller Bearing Mfg. Co., East Orange, N. J., has been incorporated with a capital of $2,000,000 by H. M. Picking, C. O. Geyer and S. L. Gedney, Jr.

On or before Feb. 1, the works of the T. A. Gillespie Co., Morgan Station, near Perth Amboy, N. J., will revert to the Government, having heretofore been operated for shell loading under lease, to be used as a storage plant by the Ordnance Department. It is said that plans are under way to convert the plant into an arsenal.

The Federal Shipbuilding Co., Kearny, N. J., has acquired property, 90 x 225 ft., near the Lincoln Highway, adjacent to the Hackensack River, Jersey City, for works extensions. L. H. Korndorff is vice-president and general manager.

The Standard Shipbuilding Corporation, 44 Whitehall Street, New York, has acquired from the New Jersey Board of Commerce and Navigation for $45,900 a tract of property, about 590 x 1800 ft., on the north side of Shooter's Island.

The Mechanical Tool & Machine Co., Baltimore, Md., with branch at Chicago, has leased property at 229 West Fifty-second Street, New York, for a local establishment.

The Cross & Katz Metal Spinning Co., New York, has been incorporated with a capital of $20,000 by A. Katz, A. B. Boyar and C. S. Cross, 281 Brook Avenue.

The Todd Dry Dock & Construction Corporation, New York, has increased its capitalization to an active capital of $850,000.

The Essex Iron & Metal Co., Newark, N. J., has filed notice of organization to operate a plant on Avenue M, near the Central Railroad of New Jersey. John J. Blake, 1154 Broad Street, heads the company.

Buffalo

BUFFALO, Jan. 20.

The structural steel works plant of the Warsaw-Wilkinson Co., Warsaw, N. Y., was destroyed by fire Jan. 14 with a loss of 75,000.

The Empire Mfg. Co., Binghamton, N. Y., has let contracts for a factory, 60 x 136 ft., on LeRoy St., to cost $18,000.

The New York Central Railroad Co., Grand Central Terminal Bldg., New York City, has prepared plans for an engine house to be erected at West Albany at an estimated cost of $70,000. W. J. Wilgus, chief engineer.

The Sawyer Brass & Iron Foundry, Oswego, N. Y., has had plans drawn for a foundry, 65 x 165 ft., to be erected on East Oneida Street at an estimated cost of $100,000. Jos. S. Sawyer is president.

A factory building, 35 x 185 ft., one story, will be erected on Seneca Street, Geneva, N. Y., by the A. Stolp Co., manufacturer of lock seaming machines. Equipment to be installed will include lathes, milling machines, shapers and grinders. A. Stolp, 308 Washington Street, is manager.

The Oswego Tool Co., Oswego, N. Y., is having plans prepared for a factory building on West First Street.

The Perfect Fuse Co., Buffalo, has filed notice of change of name to the Pierce Fuse Corporation.

The Symington-Anderson Co., Rochester, N. Y., is reported to be arranging for the sale of its gun manufacturing works on University Avenue to other interests. The plant was constructed in co-operation with the Government for the manufacture of munition specialties for the army department.

The Willis Electric Corporation, Buffalo, has been incorporated with a capital of $100,000 under Delaware laws by James A. Willis, E. B. Parson and Stelmo C. Dyer to manufacture electrical specialties.

The Sargent & Greenleaf Co., Rochester, N. Y., manufacturer of keys and locks, has arranged for a preferred stock issue of $300,000 to be used for expansion.

The Foster Brothers Mfg. Co., Utica, N. Y., manufacturer of iron and brass beds, has increased its capital from $350,000 to $600,000.

The Usona Dental Co., Ogdensburg, N. Y., has been incorporated with a capital of $50,000 by F. H. Palser, R. E. Hannan and H. P. Hannan, 83 Washington Street, to manufacture dental instruments.

The B. E. Hedges Co., Auburn, N. Y., has been incorporated with a capital of $40,000 by B. E. Hedges, L. W. Moulton and G. McPherson, Syracuse, to manufacture engines, etc.

The Farmers' Standard Carbide Co., Canastota, N. Y., has increased its capital from $25,000 to $300,000.

The Allen Windows Co. of America, Elmira, N. Y., has been incorporated in Delaware with a capital of $500,000 to manufacture special windows and other equipment. Victor M. Allen, Shingle House, Pa.; George A. Scott, Waverly, N. Y., and George A. Dudley, Elmira, N. Y., are the incorporators.

New England

BOSTON, Jan. 20.

The P. W. V. Automatic Machinery Corporation has been incorporated in Massachusetts and has purchased the "Radical" automatic screw machine business from the Fitchburg Machine Works, Fitchburg, Mass. C. E. Van Norman, Springfield, Mass., is president of the company; C. J. Wetzel, Springfield, is secretary and treasurer; and L. M. Waite, Fitchburg, is vice-president and sales manager. Plans are under way for an enlarged output of the four-spindle type "Radical" screw machine, and an extensive plant to be established at Springfield is contemplated.

Damage by fire to a factory building of L. A. Woods Machine Co., Boston, is estimated at about $200,000, but plans for rebuilding are not yet decided.

Plans privately prepared by C. W. Parks, chief of the U. S. Bureau of Yards and Docks, Washington, contemplate expenditures of $300,000 on station development for the New England coast. Same department has in hand plans for a $400,000 pier at the Charlestown Navy Yard, Boston. The sum of $1,000,000 is also estimated for station development at Newport, R. I.

Plans are in progress for a hardening shop, one-story, 90 x 300 ft., for the New Departure Co., Bristol, Conn.

A pump house with a reinforced concrete intake pipe, 300 ft. x 30 in., will be installed by the American Electrical Works, Phillipsdale, R. I.

Everlastic, Inc., manufacturer of webbing, Boston, has begun the erection of a factory, three stories and one story, 200 x 100 ft., at Chelsea, Mass.

Work has begun on a heating plant and a cold storage building, costing $1,000,000, for the U. S. Navy Department, at Newport, R. I.

Conn Ice Cream Co., Burlington, Vt., has let a contract for factory alterations, costing $40,000, to be two stories, 48 x 88 ft., at Lewiston, Me.

Jewel Belting Co., Hartford, Conn., has plans on hand for a factory.

A two-story factory building, 50 x 200 ft., costing $60,000, will be erected for Morris and A. L. Rudnick, Boston, operations starting next month.

Philadelphia

PHILADELPHIA, Jan. 20.

The Abram Cox Stove Co., American and Dauphin streets, Philadelphia, has taken out a building permit for extensions in its foundry.

The Sobel Multiplying & Bookkeeping Machine Co., Philadelphia, has been incorporated with a capital of $300,000 by Phillip L. Sobel, John McAllister and John L. Herman, to manufacture multiplying machinery and other appliances.

Winfield S. Barnes & Co., Philadelphia, operating an iron works at 422 Rhawn Street, have taken out a building permit for a one-story building, 40 x 100 ft., at Twentieth Street and Erie Avenue.

The Mulconroy Co., Fifty-fourth and Jefferson streets, Philadelphia, manufacturer of metallic hose, etc., has opened a branch establishment at 112 Market Street, Pittsburgh.

Machinery and stock to the value of $500,000 was destroyed by fire Jan. 13 at the plant of the A. Colburn Co., Eleventh and Nevada streets, Philadelphia, manufacturer of spices, etc. The loss to the building, in addition, is estimated at $200,000.

The Navy Department will build a pumping plant at the Naval Home, Grays Ferry Road, Philadelphia. A new water tower and tank house will also be constructed.

The Pennsylvania Steel Export Co., Widener Building, Philadelphia, has increased its capital from $210,000 to $500,000.

Fire Jan. 12 destroyed a portion of the sheet metal works of Hugh H. Ward, Fourth and Bunting streets, Chester, Pa.

The W. G. Runkles Machinery Co., Trenton, N. J., has been incorporated with a capital of $125,000 by Walter G. Runkles and Charles T. Clarke, Trenton, and C. C. Klockner, Fallsington, Pa., to manufacture agricultural and other machinery.

Arrangements have been perfected by the Ordnance Department to convert the bag loading works at Tullytown, Pa., operated during the period of the war by the E. I. duPont deNemours Co. into an ordnance supply station.

Pevice & Williams, Bristol, Pa., operating a plant at Dorrance and Canal streets for the manufacture of planing mill products, closed down their plant temporarily Jan. 18. It is said that high prevailing wage scales are the cause of the suspension.

The Goff Mfg. Co., Collingswood, N. J., manufacturer of valves, is reported to have closed negotiations with the Ohio Crane Co. and the Carroll Foundry & Machine Co., Bucyrus, Ohio, to furnish its drainage valve for installation on their different specialties.

Fire Jan. 16 destroyed a portion of the works of the Lititz Motor Co., Lititz, Pa., with loss estimated at $9,000.

The Calorie Furnace Co., Sellersville, Pa., has been incorporated with a nominal capital of $5,000 by M. H. Rickett and others to manufacture furnaces, etc.

The Philadelphia & Reading Railroad, Reading Terminal, Philadelphia, will build a new crane runway at its Bethlehem works.

The American Can Co., New York, has resumed operations at its works on West Fourteenth Street, New Castle, Pa., at about 50 per cent of regular output. The plant was recently closed down for repairs.

Fire Jan. 15 destroyed a portion of the mill of the Bangor Slate Co., Bangor, Pa., with loss estimated at $12,000.

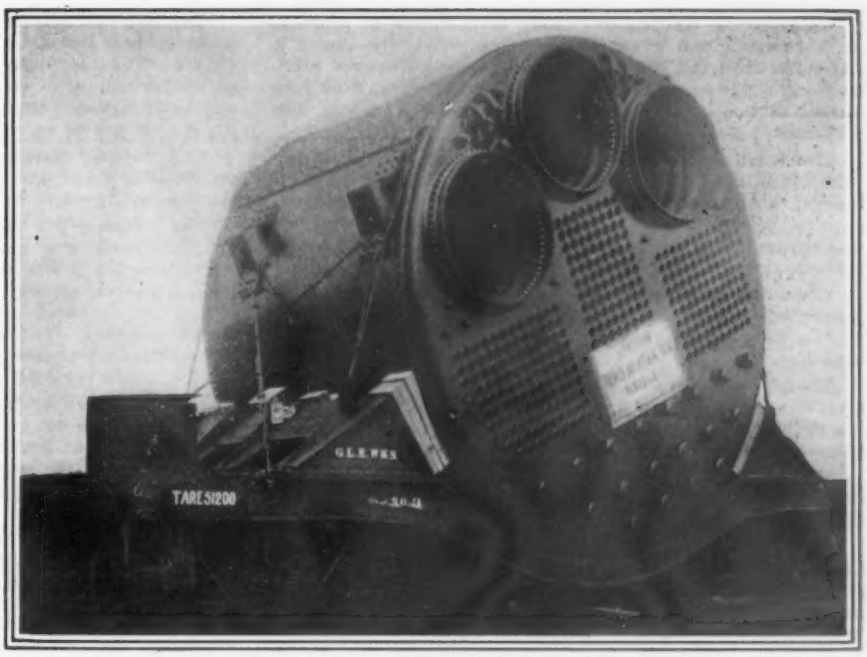
The Baltimore & Ohio Railroad, Baltimore, Md., will soon commence the construction of a one-story car repair shop, 30 x 50 ft., at Somerset, Pa.

Chicago

CHICAGO, Jan. 20.

Business continues to come out in fairly satisfactory volume, some large groups of tools having been purchased in the week. The Chicago Pneumatic Tool Co. was the buyer, also the Moline Plow Co., and a washing machine manufacturer, while scattered sales have been made in several directions. The Chicago & Alton list is hanging fire in part, but will be completly closed soon.

The Government, through the Salvage Board, is sending out requests for bids on 50 items of shell-making equipment which was purchased for Cribben & Sextion, Chicago. The arrangements for the firm to manufacture shells were nipped in the bud by the end of the war. Several of those who took contracts to supply the navy with equipment of various kinds are still on the work, although some makers of



One of the 30 Large Marine Steel Boilers, 14½ Ft. in Diameter by 11 Ft. 2 In. in Length, which the Kingsford Foundry & Machine Works, Oswego, N. Y., Is Sending by Rail for Installation in 15 Vessels Building on the Great Lakes. Each boiler weighs 91,000 lb. and two are installed in each ship. A special steel car had to be built to carry them

naval ordnance in the West have been told to suspend operations.

A manufacturer of power presses in the Middle West has about $100,000 worth of work suspended by Government order on which settlements are proceeding very slowly, although it is expected that a satisfactory adjustment will be reached. The manufacturer in question finds business on the mend, having done more in the first week of January than in all December.

The Chicago Corrugating Co., recently incorporated with a paid up capital of $30,000, has purchased a factory at 1544 to 1546 Fifty-first Court, Cicero, Ill. The incorporators are W. F. Waller, former manager of the city sales department of Hibbard, Spencer, Bartlett & Co.; A. P. Siersma of the same company, and E. A. Robertson, former treasurer of the Robertson Mfg. Co. The company is now manufacturing eaves trough, conductor pipe and other sheet metal products.

The Cullen-Friested Co., 7 South Dearborn Street, Chicago, engineering contractors, have purchased property 152 x 330 x 445 ft. at Kilbourn Avenue and Thirteenth Street, Chicago, and will erect a plant to cost about $40,000.

The Roberts Portable Oven Co., 2024 North Major Street, Chicago, has leased a three-story building at 835 to 837 West North Avenue, which will be remodeled to meet the demands of the company in manufacturing.

Plans have been prepared and bids will soon be taken by Robert R. Cenek, architect, 105 South La Salle Street, Chicago, for a one-story service building, 75 x 16 ft., Wabash Avenue and Forty-third Street, for P. E. Erlinder & Co., automobile repairer, 3215 Wabash Avenue. The structure will cost $25,000 and be used principally in the manufacture of auto bodies.

The Pennsylvania Railroad, Union Station, Chicago, is planning for the construction of a one-story shop, about 50 x 70 ft., on Fourteenth Street.

The Acme Malting Co., 175 West Jackson Boulevard, Chicago, has filed plans for the construction of a new one-story power plant at Cortland Street and Kilbourne Avenue, to cost about $15,000.

Fire in the building at 3622 South Morgan Street, Chicago, occupied by the Greenpoint Metallic Bed Co., C. P. Kelly & Co., United Table Co. and the Cleveland Metal Products Co. caused a total loss estimated at about $75,000 on Jan. 14.

The Chicago, Rock Island & Pacific Railroad, Chicago, has broken ground for the construction of an addition to its machine shop at Invergrove, Minn.

The Hoefer Mfg. Co., Freeport, Ill., manufacturer of drilling attachments, etc., has broken ground for the erection of a one-story addition to its plant, about 60 x 80 ft., to cost $30,000.

Fire Jan. 6 partially destroyed the four-story furniture manufacturing plant of A. J. Johnson & Sons, 517-37 Noble Street, Chicago, with loss estimated at $150,000.

The Acme Boiler & Tank Co., 1017 West Forty-eighth Street, Chicago, has awarded contracts for a one-story machine shop and boiler works, 50 x 85 ft.

Baltimore

BALTIMORE, Jan. 20.

The Hancock Foundry Co., Hancock, Md., plans to enlarge its present facilities.

The Salisbury Ice Co., Salisbury, Md., will build a plant and install motors and hoisting elevators.

The Baltimore Dry Docks & Shipbuilding Co., Baltimore, has awarded a contract for the construction of a one-story storage building of fireproof construction, 22 x 50 ft.

Charles A. McLean, Citizens' Bank Building, Norfolk, Va., wants prices on duplex boiler-feed pumps not larger than 10 x 6 x 10.

George F. Adams, manager, Hotel Chamberlain, Fort Monroe, Va., is seeking prices on boilers and generators.

The Double Shoals Cotton Mills, Shelby, N. C., wants prices on lathes.

The wrecking house of the Southern Railway, Birmingham, Ala., was recently badly damaged by fire. Considerable machinery was damaged.

G. T. Backus & Son, Fort Pierce, Fla., are said to be planning to enlarge their present boat-building plant.

The Hagerstown & Frederick Railway Co., Hagerstown, Md., is planning for the rebuilding of its electric plant at Myersville, recently destroyed by fire.

Considerable mechanical and electrical equipment, including conveyor, elevator and other machinery will be installed in the new reinforced-concrete canning plant to be erected by the B. F. Shriver Co., Westminster, Md., at a cost of about $40,000. A power plant and boiler house will also be constructed for factory operation.

The Foundation Co., New York, plans for the immediate construction of a new power plant at its shipbuilding works at Savannah, Ga. The station will be used for plant operations.

Fire Jan. 10 destroyed the plant and machinery of the Fletcher Guano Co., Columbus, Ga., with loss estimated at $150,000. It is understood that the plant will be rebuilt.

Pittsburgh

PITTSBURGH, Jan. 20.

The plant of the Power Piping Co., Beaver and Western avenues, Northside, Pittsburgh, has been purchased by the Ridge Land & Improvement Co., for about $200,000. The present occupant has a long-term lease on the plant, and it is understood will continue to operate at this location.

The American Bridge Co., Pittsburgh, has received an order from the United States Railroad Administration for the construction of 25 all-steel barges for Mississippi River service. It is understood that the contract provides for completion within one year. The company is now completing a large order for steel barges for the Carnegie Steel Co., about 30 boats still awaiting construction.

To complete the full ownership to a square of property at Longworth and Blair streets, Hazelwood, the Jones & Laughlin Steel Co., Pittsburgh, has recently acquired additional property at this location. It is said that its land purchases in this section total close to $1,000,000 for the past 9 months.

The Hussey-Binns Shovel Co., Pittsburgh, has made application in the Common Pleas Court for a cancellation of its charter, with intention to dissolve the business. The company is one of the old concerns in the city, having been organized in 1874 by C. C. Hussey and Ralph H. Binns. Active manufacturing was suspended some time ago.

The Pittsburgh Finish & Stair Co., Pittsburgh, is having plans prepared for a one-story and basement plant, 70 x 80 ft., at California and Sedgwick avenues, to cost about $15,000.

The Carnegie Steel Co., Pittsburgh, has acquired property, 70 x 100 ft., on Braddock Avenue, East Pittsburgh, for $20,000. The site adjoins the other holdings of the company in this section.

The Pittsburgh Wire Rope Co., Pittsburgh, has been incorporated by A. E. Harn and associates with capital of $10,000 to manufacture wire rope, etc.

The Allegheny Steel Co., Pittsburgh, has acquired the plant of the Western Tool & Forge Co., Brackenridge, Pa., consisting of about 6 acres with works buildings which will be occupied by the purchaser as a steel works. The Western Tool & Forge Co. has retained all machinery and equipment and is understood to be planning to locate a works in the vicinity.

Milwaukee

MILWAUKEE, Jan. 20.

New business in machine tools is developing slowly but surely, and local manufacturers feel that under the circumstances conditions are fairly satisfactory in this respect. A fair volume of business was placed during the past week in single tool or small lot requirements, mainly for the automotive industry. Inquiry continues active, indicating that there is considerable new business in sight which will probably be placed as soon as the existing state of uncertainty is past. Production is going forward in a satisfactory manner, and while it is not of the quantity to which makers became accustomed during the last two years, it nevertheless is above the normal of average years. The attitude of the local industry is one of hopefulness. Dealers are gradually coming into the market to replenish stocks and it is confidently felt that it will be but a short time before the unsettled feeling will be overcome.

The Badger Meter Mfg. Co., 261-265 Third Street, Milwaukee, manufacturer of water meters, has acquired the entire plant and equipment of the Christensen Engineering Co., at Thirtieth Street and Meinecke Avenue, and after making alterations and improvements will take occupancy about Feb. 1 or 10. The Christensen plant consists of three brick, steel and concrete buildings, namely, a machine shop, 83 x 144 ft., an assembling and erecting shop, 60 x 110 ft., and a warehouse and office, 40 x 110 ft. It provides sufficient space to increase the output of the Badger company about 400 per cent. The company intends to equip part of the assembling shop as a brass foundry and is now inquiring for equipment for delivery about March 1. J. J. Leach is president and general manager.

The main building of the plant of the Gas Tank Recharging Co., 1245 Twenty-third Avenue, Milwaukee, was totally wrecked by a series of explosions and resulting fire on Jan. 13, causing an estimated loss of $50,000. The plant was used for producing and compressing acetylene gas for industrial and other purposes. It is believed likely that the company will rebuild, although it may consolidate the Milwaukee corporation with the new carbide manufacturing plant which it recently established at Keokuk, Ia., at a cost of $500,000. Fred J. Pagels is treasurer and general manager.

The Wisconsin Metal Refining Co., Milwaukee, has changed its name to Wisconsin Brass Foundry Co., to better designate the present nature of its principal business. The plant is located at Fratney and Franklin streets. N. A. Boehm is secretary and treasurer.

The Gardner Machine Co., Beloit, Wis., manufacturer of disc grinders and grinding wheels, has increased its capital stock from $500,000 to $750,000 to accommodate the expansion of its business and enlargement of its facilities.

The Common Council of Beloit, Wis., has ordered the city engineer to make surveys and prepare estimates of the cost of a new steel or reinforced concrete stationary span across the Rock river, to be 500 ft. long and 54 ft. wide. The work is planned to be undertaken this year. Bert Wood is city clerk.

The National Machine Co., 686-690 National Avenue, Milwaukee, has increased its capital stock from $35,000 to $50,000. The new issue will be devoted to the enlargement of production. The company does a general machine shop and engineering business. Franklin Sweet is president and F. W. Krieger is secretary and treasurer.

The Bloomer Machine Works, Bloomer, Wis., has wound up its affairs and will be dissolved. It discontinued operations some time ago and has liquidated its assets.

The National Oil Products Co. of New Jersey has purchased a tract of 10 acres at Keefe and Humboldt avenues, Milwaukee, as a site for a new factory to be erected and equipped at an estimated cost of $100,000 for the production of oils and chemicals for the leather tanning and manufacturing industry. Details of the project have not been divulged. Carl Remeeus, 120 Wisconsin Street, Milwaukee, represents the New Jersey company in its land acquirement.

Adolph G. Milverstedt, Madison, Wis., has plans for a three-story fireproof public garage and repair shop, 35 x 125 ft., to be erected adjacent to the Hamacher Hotel, owned by him. Work will begin about April 1.

The Magnus Co., Inc., 241-253 Greenfield Avenue, Milwaukee, brass founder, will build an addition to its pattern shop and pattern storage vault at a cost of $2,500. C. H. Duback is general manager.

Lindsay Bros., 78-94 Reed Street, Milwaukee, manufacturers and jobbers of agricultural machinery, implements, etc., has incorporated the business under the style of Lindsay Bros., Inc., with a capital stock of $200,000. The incorporators include E. J. Lindsay, George I. Lindsay and Frank H. Lindsay.

Christian M. Nelson, Fond du Lac, Wis., is preparing to establish a shop for the manufacture of a new design of hot air heating device for enclosed and delivery automobiles, upon which he recently was granted letters patent. The factory will be located at 445 Ruggles Street.

The City Water Commission, Wausau, Wis., has engaged W. G. Kirchhoffer, consulting engineer, Madison, Wis., to prepare plans and specifications for a filtration plant and air lift system and two 250,000-gal. reservoirs for the municipal water works. Estimates will be presented Jan. 24.

D. F. Waite & Son, Richland Center, Wis., will erect a new public garage, storage building and machine shop, 50 x 120 ft., two stories and basement, costing about $20,000 with equipment.

The Wisconsin Valley Power Co., Wausau, Wis., has engaged A. G. Ford, consulting engineer, to prepare plans and estimates of a new reinforced concrete power dam and alterations and additions to its hydroelectric power plant. M. C. Ewing is general manager.

The Delaney Oil Co., 45-47 Third Street, Milwaukee, refiner and wholesaler of oils, compounds, etc., for industrial purposes, has changed its corporate style to Lindsay-McMillan Co. The principal owners are Walter S. Lindsay and William A. McMillan, who are president and secretary-treasurer, respectively. The works and storage plants are located at 86 South Water Street and will be enlarged during the next few months.

Biersach & Niedermayer Co., 220 Fifth Street, Milwaukee, has taken the contract for the sheet metal work for the new six-story fireproof Central Continuation School, Sixth, Seventh and Prairie streets. The contract price is $11,358.

The J. R. Petley Co., Milwaukee, has been organized by James R. Petley, formerly president of the Petley Rubber Mfg. Co., to engage in wholesale and jobbing of belting, packing, hose and other industrial rubber goods. The company also will act as distributor of the Diamond Rubber Co., Akron, O., in the Wisconsin territory. Headquarters have been established in the Colby-Abbot building.

The Plankinton Packing Co., Milwaukee, will build a new ice machine house, 45 x 70 ft., as part of a $200,000 plant improvement scheme at its works at Muskego Avenue and Canal Street. Harry C. Culver is general manager.

The Storage Battery Service Co., 137 Oneida Street, Milwaukee, is taking bids for the erection of a new plant and service station, 60 x 127 ft., on Jefferson Street, near Juneau Avenue. The architect is R. E. Oberst, 353 National Avenue. The cost is estimated at $17,500, including machinery and other equipment.

The American Automobile Co., 187 Wisconsin Street, state distributor of Pierce-Arrow passenger and commercial cars, has acquired a site at Prospect Avenue and Ivanhoe Place for a proposed new garage, service station and machine shop to be erected later in the year at an estimated cost of $45,000. A. E. Raffauf is general manager.

Stefan Wiester, Beaver Dam, Wis., superintendent of the enameling department, Malleable Iron Range Co., has been granted letters patent on a new type of enameling oven which he intends to manufacture in quantities as soon as sufficient capital is enlisted in the project.

The Pacific Sand Co., Portage, Wis., has been organized by E. R. Calkins and A. M. Koepp to operate extensive deposits of foundry sand especially adapted for making cores for cast iron pipe and similar castings.

The Ennison Ice Cream Co., 118 Main Street, LaCrosse, Wis., will build a two-story fireproof factory and warehouse, 36 x 125 ft., costing about $20,000. It will be electrically operated throughout.

The Prest-O-Lite Co., Indianapolis and New York, has awarded the general contract for the erection of a new compressing and filling shop at 619 Trowbridge Avenue, Milwaukee, to the Madsen, Christiansen & Igbretson Co., 379 Thirty-first Avenue, Milwaukee. The shop will replace that which was destroyed by an explosion and fire on Nov. 22 and will be of reinforced concrete, 60 x 110 ft., 35 ft. high.

Powell & Mitchell, Ewen, Mich., have opened a plant for the manufacture of tool handles and other hardwood products, employing 35 operatives. It has reached a capacity of 20,000 handles per day.

Detroit

DETROIT, Jan. 20.

The waiting policy is in evidence in all lines of business. Manufacturers of the Detroit district are holding $300,000,000 in war contracts upon which the Government has not settled, tieing up factories and forcing the layoff of thousands of men. One plant alone has more than $4,000,000 in raw materials held on a contract which the Government has not validated. Other plants are situated similarly. An organization of car manufacturers has been formed to expedite the settlement of war contracts.

Building is not opening up as expected, due to the belief that prices of materials will come down.

In the neighborhood of 30,000 men are unemployed, and returned soldiers are adding to the problem. April is now set as the approximate time for the resumption of normal manufacturing.

Machine tool jobbers report a quiet market, with little prospect for a change until industries and business men adopt a more progressive policy.

The Holmes Foundry Co., Port Huron, Mich., has been incorporated with a capital stock of $1,250,000. It follows the reorganization of the Romeo Foundry Co. The officers are: L. A. Holmes, president and general manager; C. C. Peck, secretary-treasurer; William F. Hooper, general superintendent. The reorganized company is closely associated with the Holmes Foundry Co., Ltd., of Sarnia, Canada, of which Mr. Holmes is the head. The company will continue to supply castings and other foundry products required by the General Motors Co. and its subsidiaries.

The Dyke-Jenkman Construction Co., Holland, Mich., has been dissolved. Fritz Jenkman, one of the firm, has withdrawn.

The Owosso Bronze Bearings Co., Owosso, Mich., which will begin operations soon after the first of the year, occupying part of the Robbins Table Co. plant, has completed its organization. Officers were elected as follows: J. H. Robbins, president; James Van Pelt, vice-president and general manager; Albert L. Nichols, secretary-treasurer. Bronze babbitt-lined bearings for automobiles, auto trucks and electrical motors will be manufactured.

The Hinkley Motors Corporation, Detroit, will begin making a full line of engines for motor trucks and tractors Feb. 15. During the war the plant turned out a large number of motors for Class B army trucks. C. C. Hinkley is president and general manager of the corporation. A. A. Glotezner is vice-president and William A. Fisher treasurer. Within the next two years it is expected that the new concern will greatly expand its manufacturing activities. The Hinkley plant is located at West Fort and Twenty-second Streets, Detroit.

The Edmunds & Jones Corporation, Detroit, lamp manufacturers, will build a new addition to cost $35,000.

The Studebaker Corporation of Detroit and South Bend, Ind., will extend its plant in South Bend, and the factory will be complete by Jan. 1, 1920. The new plant, when completed, will have a total of 2,384,500 feet of floor space, distributed among units such as the machine shop, assembling plant, forge shop, foundry, heat treating building, stamping plant, tool room, test room, storage building and shipping room. The South Bend plant will have a capacity for 100,000 cars, only the four-cylinder models being made there, while at the Detroit plant the capacity will be increased to 60,000 six-cylinder models.

The Peninsular Machinery Co., Detroit, has moved to more commodious quarters at 279-281 East Jefferson Avenue. The company was located for three years in the Kerr Building, but recently outgrew its facilities.

The Solvay Process Co., Detroit, has purchased 75 acres of land between the Detroit River and the Detroit, Toledo & Ironton Railway, south of Detroit. Although no immediate construction program has been adopted a new plant may be put up on the property.

Large plant extensions in Detroit, Flint, Saginaw, Lansing, Mich., and Janesville, Wis., contemplated by the General Motors Corporation, await only lower prices on construction materials. The new tractor unit at Janesville is in process of construction. Saginaw is to have a new foundry, Lansing a new stamping plant and a new differential gear plant will soon be erected in Detroit.

The Auto Specialties Mfg. Co., St. Joseph, Mich., is considering the erection of a new one-story machine shop, about 80 x 400 ft.

Cleveland

CLEVELAND, Jan. 21.

Business in machine tool lines shows some improvement as compared with the few previous weeks. Dealers report the taking of quite a few orders for single machines and small lots of machine tools. The demand is limited almost wholly to the builders of automobiles, tractors and farm implements, and to the makers of automobile parts and accessories. Several inquiries that developed two or three weeks ago are now resulting in orders. One new inquiry has come from a manufacturer of automobile accessories for 40 to 50 automatic screw machines. An automobile manufacturer in the Michigan territory is planning to purchase a large lot of machinery to manufacture motors which at present it secures from outside sources.

The price situation is still uppermost in the minds of buyers and some, in sending inquiries to the trade, state that they will not be interested in purchasing machinery now if the "war-time" prices are still quoted. A manufacturer who sent out an inquiry recently for considerable machinery, states that he received quotations ranging from 10 to 20 per cent below recent prices from manufacturers of all classes of machinery that he inquired for except automatic screw machines and special milling machines. While it is conceded in the trade that price concessions are being made here and there, it is evident that at least most of the leading manufacturers in the various lines are adhering to their recent prices. These generally are guaranteeing prices for a period of three to six months. However, some of the leading machine tool builders have discontinued their policy of quoting a protective price. During the last few months of the war machinery was quite generally sold subject to price at the time of delivery, and in case a buyer wanted a protection on the price, or a definite guaranteed price, he was quoted a price 12½ per cent in excess of the list price. This excess 12½ per cent price has now been withdrawn.

The machine tool trade sees the possibility in the near future of developing considerable business among high-class garages, some of which are now planning to put in machine shop equipment. This equipment generally will include gap lathes, drill presses and cylinder grinding machines.

The Glass Coating Co., Cleveland, has been organized with a capital stock of $650,000 to manufacture glass-lined containers and other glass-lined equipment designed to withstand acids for use in plants engaged in the manufacture of chemical products. A 12-acre site has been acquired on the Nickel Plate Railroad and the contract has been placed for a factory building 165 x 240 ft. The officers of the company are: President and treasurer, Joel H. Fuller, of the Stowe-Fuller Co.; vice president and general manager, R. F. Nailler, mechanical engineer; secretary, George H. Mowery. Others on the board of directors are E. I. Heinsohn, of the Hydraulic Pressed Steel Co., and Edward A. Noll, president National Tool Co. The company has opened offices in the Leader-News Building.

The U. S. Copper Products Co., Cleveland, has placed an order with the Cleveland Crane & Engineering Co., Wickliffe, Ohio, for three 10-ton electric traveling cranes for equipping its new plant.

The Sommer-Adams Co., Cleveland, has been organized with a capital stock of $100,000 and has purchased the plant of the Permanent Machine & Mfg. Co., 2934 East Fifty-fifth Street, and will manufacture special machinery. L. A. Sommer, who is the principal promoter in the organization of the company has been connected with the Allen Motor Co., Fostoria, Ohio. W. R. Reedy, Chicago, will be president and Frank H. Adams, of Cleveland, secretary and treasurer.

The Reflex Ignition Co., Cleveland, which recently purchased a factory site near West 106th Street and the New York Central Railroad, plans to erect a plant during the coming spring for the manufacture of spark plugs.

The Maumee Malleable Castings Co., Toledo, Ohio, is planning extensions that will double the capacity of its plant. At the recent annual meeting the board of directors was in-

creased from five to seven. Those elected are: P. C. Jones, president S. M. Jones Co., and Paul H. Jones, of the same company; W. J. Schumacher, president Toledo Wheel Barrow Co.; John B. McMann, I. L. Houghton, H. A. Martie, and J. L. Tillman. I. L. Houghton is president, J. L. Tillman vice-president and general manager, J. B. McMann secretary, and H. A. Martie treasurer.

The American Steel & Machine Co., Mansfield, Ohio, is planning the erection of a tool room, 60 x 98 ft.

The Hollis Tractor Co., Pittsburgh, has purchased the plant of the American Straw Board Co., in Tiffin, Ohio, and will equip it for the assembling of tractors. Otis A. Hollis is president of the company.

The Inter-State Car Co., Indianapolis, builder of freight cars, has an inquiry out for an alligator shear 2½ in. capacity, a horizontal punching machine ¾ in. capacity, a 24 in. shaper, three jib cranes, a punching machine ¾ in. capacity, a 40-hp. generator, a 50-hp. alternating current motor, a 35-hp. and two 5-hp. motors, a 15-ton traveling crane with 40 ft. span, and a second-hand steel frame building about 335 ft. long.

The Biggs Boiler Works Co., Akron, Ohio, which will enlarge its plant, has purchased a 15-ton electric traveling crane and a number of riveting machines.

Cincinnati

CINCINNATI, Jan. 20.

An active correspondence has developed between machine tool selling agencies in Europe and local firms. The inquiries from this source are becoming quite numerous and most of them bear the earmarks of being bonafide ones and not simply put out for information. However, there is still the vexing question of having to obtain permits and oher red tape formalities that exporters now think should be done away with. Another very great drawback is the present high schedule maintained on ocean freight rates. A local firm recently received a communication from its London representatives asking for co-operation in having these rates reduced. It was plainly stated in this letter, which was from a reputable concern, that these excessive war-time freight charges would work against the sale of American machine tools in Europe more than is realized on this side.

Automobile manufacturers have been putting out some inquiries quietly, but so far they have been buying rather sparingly. The number of second-hand machines on the market is surprisingly small. Boiler and tank makers in this vicinity are very busy. Orders for boilers from the South are more numerous than at any time in the past five years.

As to the labor situation, a canvass of the metal working shops of Cincinnati and its suburbs shows that from Nov. 11 to Jan. 17 1121 employees were hired and in the same period 2714 were released, making a loss of 1593. This loss is represented largely in the release of common labor, and includes female employees in some shops.

The Lodge & Shipley Machine Tool Co., Cincinnati, has increased its capital stock from $100,000 to $1,000,000. This action was taken to care for the company's expanding business. A large addition to its plant on Colerain Avenue was recently completed, but this branch of the plant is not yet in operation.

The plant of the General Briquetting Co. at Winton Place, Cincinnati, is now in operation. The company is making briquettes of cast borings under a new process. M. P. Jacomini is president.

The Babcock & Wilcox Co. has been awarded contract for the installation of two large high-power boilers in the municipal waterworks plant of Cincinnati.

The Niles Tool Works Co., Hamilton, Ohio, has removed its offices to a newly constructed executive building and is remodeling its former office headquarters to be used for manufacturing purposes.

The Domestic Engineering Co., Dayton, Ohio, has acquired part of the plant of the Dayton Metal Products Co., which will be used for the manufacture of domestic lighting outfits.

The J. A. Reid Co., Dayton, Ohio, has been incorporated with $25,000 capital stock by J. A. Reid and others. The daily press announces that the company will manufacture dental equipment.

It is reported that the Atlas Brass Foundry Co., Columbus, Ohio, maker of automobile pumps and other specialties, is contemplating enlarging its plant at an early date. Details are not yet available.

The B. P. Mfg. Co., Anderson, Ind., will establish a plant in North Anderson for the manufacture of automobile trailers.

It is reported that the plant of the Virginia Chain Co., Parkersburg, W. Va., recently destroyed by fire, will be rebuilt at an early date.

Indianapolis

INDIANAPOLIS, Jan. 20.

The Studebaker Corporation, South Bend, Ind., is planning for the completion of its new local automobile works during the present year. The works will have a capacity of about 100,000 cars a year and will be devoted to the production of the new light-four Studebaker car. The entire plant will provide an increased manufacturing area of over 2,000,000 sq. ft., and will consist of machine shop, foundry, forge shop, assembling department, stamping plant, heat treatment shop, car testing plant, tool works and other departments. The works will be fully equipped in all departments for different manufacturing operations, including traveling cranes, magnets, power and gravity conveyors, industrial railway lines, as well as general machine tools and mechanical apparatus. The power plant for operation has been completed, providing a capacity of about 8,000 hp. The company will use its plant at Detroit for the production of six cylinder cars, with aggregate capacity of about 60,000 cars of this type per annum. The new plant in conjunction with the Detroit works will practically double the capacity of the previous output. The company, it is understood, has been relieved of all war contracts for the United States and foreign countries, placing it in position to resume the manufacture of regular Studebaker cars.

Fire Jan. 11 destroyed a portion of the works, including power plant, of the United States Encaustic Tile Co., 349 West Sixteenth Street, Indianapolis, with a loss estimated at about $25,000.

The Central South

LOUISVILLE, Jan. 20.

The United Coal & Coke Co., Lynch, Ky., is planning for the installation of a new coal tipple.

The Blake Window Hanger Co., Middlesboro, Ky., is planning for the establishment of a plant for the manufacture of metal window hangers and kindred products.

A recent fire at the plant of the duPont Powder Co., Nashville, Tenn., caused a loss in machinery and plant buildings estimated at $100,000.

St. Louis

ST. LOUIS, Jan. 20.

The Bevo Packing Co., capital $1,000,000 has been organized by the Anheuser-Busch Brewery interests in St. Louis and will remodel the brewing plant for the packing business and feed manufacture.

The Little Rock Pickery & Reginning Co., Little Rock, Ark., is reported in the market for about $25,000 of additional machinery.

George Lewis, Homer, La., will build and equip a cotton gin, saw mill, etc., and is in the market for power plant equipment and other machinery.

The W. P. Galloway Co., Little Rock, Ark., will equip an electric light and power plant involving about $50,000 for machinery. W. P. Galloway is president.

The Commonwealth Power Co., Clarendon, Ark., A. Perry, manager, will equip an electric light and power generating plant.

Marshall, Mo., will equip an electric light and power plant and will receive bids in January. Henrici, Kent & Lowry, Kansas City, Mo., are engineers in charge.

The Excelsior Springs Light & Power Co., Excelsior Springs, Mo., will enlarge its generating plant and extend its distribution system.

The Southwestern Steel Co., Sand Spring, Okla., will equip a plant for the manufacture of iron and brass castings and other metal products.

The Cyril Refining Co., Cyril, Okla., will equip an oil refinery involving about $150,000. L. A. Davis and others are interested.

The Lawton Refinery Co., Lawton, Okla., will equip a pipe line and install pumping stations of 5,000 barrels' capacity.

The Prairie Pipe Line Co., Independence, Kans., will enlarge or install new oil pumping stations at Pauls Valley, Ringling and Shawnee, Okla.

The Great Southern Preserving Association, Western Indemnity Bldg., Dallas, Tex., will install dehydrating plants in a number of Texas and Louisiana towns and is in the market for the equipment.

R. W. Banks, Oil City, La., is in the market for pipe threading machinery, 0 to 4 in. and 4 to 12 in.

Texas

AUSTIN, Jan. 18.

The Commonwealth Refining Co. of Wichita Falls has let a contract to the McMahon Construction Co. of Tulsa, Okla., for the construction of a 1,000-barrel oil refinery. According to the terms of the contract the plant is to be finished and ready for operation by March 15.

The Southland Tire & Rubber Co. will begin the construction of its new tire manufacturing plant at Fort Worth about February 15, it is announced. The proposed plant will give employment to about 400 men. Machinery for the plant is now being assembled. The company has a capital stock of $2,000,000. William Ginnuth is president.

The Ranger Light & Power Co., Ranger, Tex., recently incorporated with a capital of $20,000, is planning for the establishment of an electric light and power plant. S. C. Green heads the company.

Fire at the power plant of the San Antonio Public Service Co., San Antonio, Tex., located at Villita, caused a loss estimated at about $25,000 on Jan. 10. It is understood that the plant will be rebuilt immediately.

The Evans-Thwing Co., Fort Worth, Tex., has acquired a site for the construction of its proposed oil refining works. The initial plant will have a capacity of 5,000 barrels a day and is estimated to cost over $500,000.

San Francisco

SAN FRANCISCO, Jan. 14.

With industries classified as non-essential during the war period resuming active business, increased demand for all kinds of machinery and machine tools is affected. The shipyards are still buying machines from time to time and continue to be the most active purchasers so far in the field. Inquiry is increasing every week, although there is still some hesitancy about buying at the old prices. The action of a number of the machine tool makers in setting a price behind which they will stand for a period of six months, together with the agreement to refund in case the market drops during that period, is having a decidedly stabilizing effect and is expected to result in an increased number of sales as soon as labor conditions on the Coast become more settled. The labor situation in this territory is admittedly precarious, if not actually dangerous. Both sides to the controversy have issued ultimatums and it is stated that a "show-down" will come before the end of the week. The latest question under dispute is the Saturday half holiday. The machinists' union demanded that all shops close at noon on Saturdays, and last Saturday afternoon they walked out. The Metal Trades' Association claims this is a violation of the contract between the Iron Trades Council and the association and has called upon the council to compel the machinists to work Saturday afternoon or to expel them from the council. Another feature of the trouble is a strike of the machinists (about 110 in number) of the Main Iron Works without the consent of the council, to force the reinstatement of a discharged man. In the meantime, the various trades affiliated with the council are voting on a strike proposal over the Macy scale, and every union so far reporting has voted in favor of striking Feb. 1. All in all, it is difficult to see how settlement of all these questions can be reached without a strike of greater or lesser extent.

Jacob Feykert, owner of the Fair Mfg. Co., San Francisco, has purchased the McCormick Bros. Iron Works, San Francisco.

C. F. Braun & Co., machine shop, San Francisco, is building a foundry in the rear to operate in connection with the shop.

The California Metal Works, Oakland, is building a one-story reinforced concrete factory in connection with its plant at a cost of $30,000.

The American Machine Co., Oakland, is about to build a new factory building and two warehouses in that city.

The Ohio Mfg. Co., Sandusky, is planning to erect a tractor factory at Sacramento, Cal. The plant is to be the center of distribution for California, Arizona, Nevada, Oregon, Washington and Idaho.

The American Brake Shoe & Foundry Co., of California, a subsidiary of the Delaware corporation, was recently incorporated in this State. It is said the company intends to engage actively in the manufacturing business in San Francisco or its vicinity. The local company is capitalized at $500,000.

The Western Auto Stage Co., Bakersfield, is erecting a large repair and machine shop in connection with its garage in that city.

The Harbor Board, Honolulu, is planning to erect an electric crane to handle heavy shipments up to 25 tons. Because of the removal of the steamers of the Matson line for war purposes and the fact that many steamers now calling at Honolulu have not been equipped to handle heavy freight, a considerable quantity of machinery is now tied up in San Francisco for lack of facilities in unloading it.

The Alexander Machine Works, Oakland, has been incorporated by J. J. Alexander, the principal owner, under the name of the Alexander Machine Works, Inc.

The Pacific Northwest

SEATTLE, Jan. 14.

The unsettled labor condition continues to be a serious factor in Northwest industrial matters. A recent decision reached by the Pacific Coast District Metal Trades Council provides that Pacific Coast unions of shipyard workers, claiming a membership of nearly 150,000, will hereafter refuse to recognize the authority of the Macy Shipyard Wage Adjustment Board to fix or regulate wages, and will insist upon the right to negotiate working agreements with their employers upon such terms as shall be agreed upon. This will probably avert a general walkout, but will result in numerous harrassing strikes that will materially slow up production. There is now under way a limited strike of electrical workers in various shipyards which is seriously crippling output.

About 50 per cent of the mills of the Northwest have resumed work, and the remainder will do so as soon as the situation warrants. Mills and camps, crowded to capacity with work during the entire period of the war, find themselves in need of extensive repairs, and these will be taken care of before plants are reopened. Machinery market is in good condition, with fair demand from all lines. Closing of a large number of wooden shipyards has limited demand for small equipment from that source.

Mining operations are slowing down, and several plants, operating on a large scale, have been closed down indefinitely.

The Great Northern Railway Co. will expend about $325,000 in its Spokane division in laying 30 miles of standard 90 lb. rails and other improvements. At Hillyard, Wash., yard enlargements will be made at a further cost of $150,000, including addition of ten miles of tracks. The company has under construction a block signal system between Hillyard and Leavenworth, costing about $200,000. Plans are under way for block signal work in the Cascade division, between Skykomish and Dalta, to cost $166,000.

The Northwest Machinery & Hydraulic Co., Vancouver, Wash., recently organized, will establish a plant in that city, it is reported, for the manufacture of hydraulic donkey engines. The company is capitalized at $125,000 by J. C. Sheasley and F. E. Kenny of Portland.

Western Rolling Mills Corporation, Tacoma, has been incorporated by J. Johnson, H. P. Brush and Mellen L. Stickney for $2,000,000. It is reported large rolling mills will be constructed in Tacoma.

The Barrett Co., Ltd., Vancouver, B. C., plans the construction of a new plant at Eburne, B. C., to manufacture all kinds of roofing materials. The plant will represent an expenditure of about $80,000.

The Western Iron Works, Anacortes, Wash., is completing the first unit of its new plant, and a structure 88 x 100 ft. has been built. The company will manufacture special type trucks, and will conduct a marine repair plant. The present plant is the first of several units to be built.

The East Waterway Dock & Warehouse Co., Seattle, plans the expenditure of more than $200,000 in warehouse and dock extensions at its big terminal on Harbor Island. This investment will bring the total value of the property up to $1,000,000. The improvements will include additional warehouses and 350 feet extension of its present 1100 foot wharf.

Sawmills in British Columbia, it is authentically reported, are completing arrangements for contracts for lumber for Great Britain that will keep all the mills in the province busy for at least 18 months. The contracts are expected to aggregate $20,000,000.

Government Purchases

WASHINGTON, Jan. 20.

Bids will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, schedule 7698½, for one plate bending roll and squaring shears for New Orleans, opening Jan. 27.

The general purchasing officer, Panama Canal, Washington, will receive sealed proposals under circular 1251 for machine shop equipment, until Feb. 3.

Current Metal Prices

On Small Lots, from Merchants' Stocks, New York City

The quotations given below are for small lots, as sold from stores in New York City by merchants carrying stocks.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipment in carload lots from mills, these prices are given for their convenience.

On a number of articles the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general headings of "Iron and Steel Markets" and "Metal Markets."

Iron and Soft Steel Bars and Shapes

	Per lb.
Bars:	
Merchant iron, base price	4.57c
Refined iron, base price	5.32c
Burden's H. B. & S. bar iron, base price	6.40c
Burden's best bar iron, base price	6.60c
Norway bars, base price	20.00c
Soft Steel:	
¾ to 1⅞ in., round and square	3.97c
1 to 6 in. x ⅜ to 1 in.	3.97c
1 to 6 in. x ¼ and 5/16	4.07c
Rods—⅝ and 11/16	4.02c
Bands—1½ to 6 x 3/16 to No. 8	4.57c
Shapes:	
Beams and channels—3 to 15 in.	4.07c
Angles:	
3 in. x ¼ in. and larger	4.07c
3 in. x 3/16 and ⅛ in.	4.32c
1½ to 2½ in. x ⅛ in.	4.32c
1½ to 2¾ in. x 3/16 in. and thicker	4.07c
1 to 1¼ in. x 3/16 in.	4.12c
1 to 1¼ in. x ⅛ in.	4.17c
⅞ x ⅞ x ⅛ in.	4.22c
¾ x ⅛ in.	4.27c
⅝ x ⅛ in.	5.07c
½ x 3/32 in.	5.77c
Tees:	
1 x ⅛ in.	4.47c
1¼ in. x 1¼ in. x 3/16 in.	4.37c
1½ to 2½ x ¼ in.	4.17c
1½ to 2½ x 3/16 in.	4.17c
3 in. and larger	4.12c

Merchant Steel

	Per lb.
Bessemer machinery	3.97c
Tire, 1½ x ½ in. and larger	3.97c
Toe calk, ½ x ⅜ in. and larger	4.72c
Open-hearth spring steel	8.00c
Standard cast steel, base price	16.00c
Extra cast steel	18.00 to 20.00c
Special cast steel	23.00 to 25.00c

Tank Plates—Steel

¼ in. and heavier	4.27c

Sheets

Blue Annealed

	Per lb.
No. 8 and 3/16 in.	5.12c
No. 10	5.17c
No. 12	5.22c
No. 14	5.27c
No. 16	5.37c

Box Annealed—Black

	One pass, C. R. soft steel, per lb.	Wood's refined, per lb.
Nos. 18 to 20	6.02c	—
Nos. 22 and 24	6.07c	7.62c
No. 26	6.12c	7.67c
No. 27	6.17c	—
No. 28	6.22c	7.82c
No. 29	6.27c	—
No. 30	6.37c	—

Genuine Russia, as per assortment.....22½ @ 25c

Patent planished, W. Dewees Wood, A 13 to 13¼c; B 11 to 11¾c net

Galvanized

	Per lb.
No. 14	6.67c
No. 16	6.82c
Nos. 18 and 20	6.97c
Nos. 22 and 24	7.12c
No. 26	7.27c
No. 27	7.42c
No. 28	7.57c
No. 30	8.07c

No. 28, 36 in. wide, 10c. higher.

Corrugated Roofing, Galvanized

2½ in. corrugations, 10c. per 100 lb. over flat sheets.

Tin Plates

Charcoal Plates

	Per box
AAA charcoal:	
IC 14 x 20	Nominal
IX 14 x 20	Nominal
A charcoal:	
IC 14 x 20	Nominal
IX 14 x 20	Nominal

Coke Plates—Bessemer

IC 14 x 20, 107 lb	Nominal
IX 14 x 20	Nominal

Terne Plates

IC 20 x 28 with an 8-lb. coating	Nominal
IX 20 x 28 with an 8-lb. coating	Nominal

Brass Tubes, Rods and Wire, and Copper Tubes

Manufacturers have withdrawn all quotations because of unsettled prices of raw materials and will only name prices to actual buyers.

Copper Sheets

Sheet copper hot rolled, 16 oz., 29c. to 31c. per lb.

Cold rolled, 14 oz. and heavier, 1c. per lb. advance over hot rolled.

Polished, 20 in. wide and under, 1c. per sq. ft. extra over 20 in. wide, 2c. per sq. ft. extra.

Planished copper, 1c. per sq. ft. more than polished.

Tinning, one side, 6c. per sq. ft.

Copper Wire

Base price, at mill	38c

Tin

Straits pig	76⅛c
Bar	85c to 90c

Copper

Lake Ingot	25c. to 26c.
Electrolytic	25c. to 26c.
Casting	25c. to 26c.

Spelter and Sheet Zinc

Western spelter	10c to 11c
Sheet zinc, No. 9 base, casks	15½c; open 16c

Lead and Solder*

American pig lead	7½c to 8c
Bar lead	8½c to 9½c
Solder ½ & ½ guaranteed	48c
No. 1 solder	43c
Refined solder	35½c

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb	90c
Commercial grade, per lb	70c

Antimony

Asiatic	10c to 12c

Bismuth

Per lb.	$4.50 to $5.00

Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting (carload lots), f.o.b. mill, per lb	33.10c
In small lots	40 to 45c

Old Metals

The market remains in the same dull condition and transactions are few. Dealers' buying prices are nominally as follows:

	Cents Per lb.
Copper, heavy and crucible	16.50
Copper, heavy and wire	15.00
Copper, light and bottoms	13.00
Brass, heavy	9.50
Brass, light	8.00
Heavy machine composition	17.50
No. 1 yellow rod brass turnings	10.00
No. 1 red brass or composition turnings	15.00
Lead, heavy	5.25
Lead, tea	4.00
Zinc	5.00